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The demography of scorpion envenomation in Bedouin from St. Catherine, Sinai (Egypt), native remedies and precautions, a review on the efficacy of scorpion antivenom and a testable proposal for preventative treatment

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Abstract

Forty Bedouin families living in St. Catherine, Sinai Peninsula (Egypt), consisting of 74 adults and 140 children were questioned on their lifetime experience of scorpion envenomation. Sixty percent of the families contained one member who had been stung by a scorpion. Thirty individuals had been stung by a scorpion, of them, nine had died as a result. This level of mortality is comparable with data from parts of India but is higher than reported for Tunisia, Mexico, Saudi Arabia or Brazil. While most incidents receive medical attention the Bedouin also employ oral immunisation against the effects of scorpion venom, ligature and ingestion of olive oil after an attack. The efficacy of treatment of patients with antivenom, reported in the literature, is discussed and a case is made for studies to investigate the protective effects of polyunsaturated ω-3 fatty acids against the excitatory effects of scorpion toxins.

Key words: Scorpion, Envenomation, Bedouin, St. Catherine, Sinai, Egypt, Olive oil, ω-3 fatty acids.

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Introduction

Scorpion envenomation is a significant health factor in many parts of the world, particularly tropical and subtropical developing countries (Ismail, 1994). Some of the species which pose a health problem, the countries in which they are found, together with estimates of envenomation and mortality rates are listed in Appendix (1). The fast rate at which scorpion toxins disperse in the body (Ismail *et al*., 1974; Ismail, 1995; Revelo *et al.*, 1996; Santana *et al*., 1996; Krifi *et al*., 2001), the cocktail of multiple toxins (Smertenko *et al*., 2001), their affinity for binding sites on the channels of excitable cells (Gordon *et al*., 1998; Miller, 1995), coupled with a relatively slow rate of elimination from the body (Ismail *et al*., 1980; Revelo *et al*., 1996; Calderon-Aranda *et al.*, 1999; Krifi *et al*., 2001) make scorpion venom a potent destabiliser of mammalian physiological haemeostasis (Omran & Abdel-Rahman, 1992a; Gueron *et al*., 1993; Ismail *et al*., 1994; Ismail, 1995; Lourenço *et al*., 2002).

The relatively low mortality rate in adults is a reflection of their large body size but the effect on children, where the toxins are more concentrated and where the blood brain barrier may permit toxin to cross into the central nervous system, can be more severe, resulting in a higher mortality rate (Appendix 1). It is difficult to obtain an accurate account of the incidence of scorpion envenomation and its effect on the lives of people from the literature. There are few demographic figures available on the incidence or effect of scorpion envenomation on whole populations as most records have been obtained from individuals who have attended treatment centres. Calderon-Aranda *et al.* (1993) and Appendix (1) give a figure of 200,000 for total envenomations per year (*py*) for Mexico, with a resultant mortality of 700-800 *py*. Dehesa-Davila & Possani (1994) and Appendix (1) reported a more modest total for recorded incidences in Mexico. For the years 1983-1988, they give a mortality rate of 272-345 individuals *py* but suggest these figures are an underestimate by a factor of 2-3. Figures for Tunisia (Krifi *et al*., 1999; Appendix 1) record 35,000-45,000 annual envenomations with a mortality rate of 13-105 *py*. Scorpion envenomation is clearly a significant health and economic factor in countries where poisonous scorpions are endemic.

The purpose of this article is two-fold. Firstly we set out to assess the number of scorpion attacks per family in a discrete population of Bedouin located at St. Catherine, South Sinai. We asked: (i) each family to recount the total number of scorpion attacks in their memory (ii) whether victims were likely to be treated at the local health centre (iii) what treatment is employed before a patient reaches the medical centre (iv) whether scorpions are viewed with apprehension and (v) what precautions are taken against being stung. Secondly we briefly review the evidence for the efficacy of antivenom treatment and suggest potential preventative measures to mitigate the effects of envenonmation which we believe would be worth investigating.

Methods

Location and People

St. Catherine (about 28°33'N 33°56'E) is a small community located in central

southern part of Sinai peninsula, Egypt. The predominant occupation is agriculture. The population living in southern Sinai consists of about 6,000-7,000 Bedouin living a semi-nomadic existence. They belong to seven main tribes, each occupying a fairly well defined region. The 2,500 Bedouin occupying St. Catherine area belong to the Gebaliya tribe.

Sources of information

Forty Bedouin families from St. Catherine were interviewed in September 2001. Information was gathered through interviews using a standard set of questions. Parents were asked about the number of children in the family unit, whether any member of the family had been stung by a scorpion, and also what the outcome was. They were asked about which indigenous animals they saw most, what precautions they took against the effects of envenomation, what they did if someone was stung and whether the afflicted person would be taken to the medical centre in St. Catherine.

Questions on incidence of envenomation were not restricted to one period but encompassed the duration of each family unit. The records thus correspond to the family's experience of envenomation rather than a fixed time scale. All conversations were conducted in Arabic and were supervised by a senior member (M.H. El-Nagar) of the team already familiar to the local Bedouin.

Results

Family structure

The number of adults and children surveyed are given in Table (1), together with data on the number of children and their ages.

Table 1. Data on Bedouin families composition

Number of families interviewed	40
Number of couples with children	39
Number of adults / children	74 / 140
Average number of children per family (Range)	3.5 (0 – 8)
Average age of the youngest progeny (years)	7.0 ± 6.9 (SD) y
Age range of the youngest progeny (years)	0.03 - 22.0 y
Average age of the oldest progeny (years)	17.3 ± 10.8 (SD) y
Age range of the oldest progeny (years)	2.0 - 40.0 y

Two hundred and fourteen individuals were included in the survey. Most (36/40) families had more than one child. The age of the progeny ranged from 0.03-40 y.

Animals

Scorpions were both the most commonly observed animals as well as the most feared but were not the only animals of which the Bedouin are apprehensive (Table 2).

Table 2. Data on animals commonly encountered and feared

Animals	No. of times cited as seen	No. of times cited as feared
Scorpions	38 (95%)	30 (75%)
Snakes	14 (35%)	17 (42.5%)
Wind scorpions	8 (20%)	2 (5%)
Foxes	7 (17.5%)	0
Wild cats	5 (12.5%)	0
Wild dogs	3 (7.5%)	0

Scorpions were identified by the Bedouin as being either yellow (mostly: *Leiurus quinquestriatus* Hemprich & Ehrenberg, 1828, *Compsobuthus werneri* (Birula, 1908), *Scorpio maurus* Linnaeus, 1758) or black (*Nebo hierichonticus* (Simon, 1872), *Orthochirus* sp.). Snakes were the second most commonly observed and feared animals. Though the Bedouin were aware of wind scorpions (or sun spiders: mainly *Galeodes* spp.), only a small minority were frightened of them.

Scorpion envenomation

Parents were asked whether any member of their immediate family had been stung by a scorpion and what the consequences had been. Thirty individuals had suffered a scorpion attack with nine fatalities (Table 3).

Table 3: Scorpion attacks within living memory (not per year)

Data on scorpion envenomation	No. (%)
No. of individuals stung (A)	30 (14%)
No. of deaths due to scorpions' stings (B)	9 (4.2%)
% of attacks which resulted in death (A/B)	30%
Number of families in which an individual had been stung	24 (60%)
Number of families in which a death had occurred after a scorpion sting	7 (17.5%)

A majority of the families interviewed contained a member who had suffered a scorpion attack and seven families reported a fatality.

Pre-medical remedial procedures

Data on remedial procedures was remarkably consistent. The practices are listed (for 40 cases), in descending frequency of use, in Table (4).

Table 4. Data on remedial procedures following a scorpion attack

Procedure	No. (%)
Ligature the affected limb	39 (97.5%)
Drink olive oil	37 (92.5%)
Do not drink water	33 (82.5%)
Go to hospital	35 (87.5%)
Bathe the wound with vinegar	2 (5%)
Bathe the wound with fig juice	1 (2.5%)
Bathe the wound with benzene	1 (2.5%)

Almost universally, if a limb has been stung, it is ligatured. The next most common practice was to make the patient consume olive oil. There was common agreement that the patient should not drink water. Other practices, directed at treating the area around the wound, were minimally practised. Most afflicted individuals are taken to the nearest medical centre (Table 4).

Precautionary measures

Twenty seven of the families (67.5%) had practised “Logna”. This is the procedure by which a child is taken to the “El-Hawy” (The magician, i.e. an oriental Bedouin doctor) who inoculates the child against scorpion toxins. This is done by frying a small scorpion mixed with the doctor’s saliva. The mixture is given to suckling infants to immunise them against scorpion venom. The doctor takes no fees for this service as it is believed that they would annul the benefits of immunisation, but will accept gifts from the father.

Discussion

Incidence of envenomation

Direct comparison with data in Table (1) on the annual rate of envenomation are not possible as our study assessed the impact on family units rather than the rate per year, though we can compare the mortality rate per envenomation. The impact on families appears to be surprisingly high. Over half the families interviewed reported one person, sometimes two, who had been stung by a scorpion. Fourteen percent of the sample population had been stung and 30% of these had resulted in a death. This mortality rate per envenomation is higher than most figures given for other countries, except for India (Mundle, 1961; Habermehl, 1981). As in India and elsewhere, children were most at risk. We cannot, at present, attribute this apparently high mortality rate to a particular factor but suggest that further sampling be undertaken to find out whether the answers we obtained were giving a false impression of mortality rates or whether Sinai Bedouin really do suffer high rates of mortality through scorpion envenomation.

Mode of action of scorpion toxins

Scorpion venom contains multiple toxins (Becerril *et al*., 1997; Legros *et al*., 1999; Hille, 2001) which induce hyperexcitability in electrically excitable cells.

α-NaTx-toxins slow inactivation of sodium channels. β-NaTx-toxins from New World scorpions shift the voltage dependence of activation to more negative potentials while other toxins block potassium and chloride channels (Hille, 2001; Smertenko *et al*., 2001). α-NaTx-toxins from *L. quinquestriatus* lengthen the duration of action potentials in frog axons from 2 ms to 15 s (Hille, 2001) and also slow the inactivation of sodium channels in frog muscle (Catterall, 1979). β-NaTx-toxins cause Na^+ channels to stay open at resting potential for hundreds of milliseconds (Hille, 2001). Affected axons fire trains of action potentials when minimally stimulated.

Clinical consequences of envenomation

After subcutaneous (SC) injection, scorpion venom distributes round the body rapidly. Ismail *et al*. (1980) and Ismail & Abd-Elsalam (1998) have shown that ^{125}I-labelled crude venom disperses rapidly from the site of the wound, quickly appearing in the blood and organs of experimental models. Recently, using an ELISA technique to assay venom distribution in the body, Krifi *et al*. (2001) have shown that in a rabbit, SC injected venom reached its plasma peak 30-60 m after injection and could be detected in the circulatory system after only 2 m. A dose of 150 µg/kg took over 1500 m to clear from the circulatory system while half that dose was cleared in under 750 m. Venom is thus rapidly distributed around the body but is cleared from the body relatively slowly.

The response of the human body to scorpion envenomation has been described in detail by Ismail (1995) as well as by other authors (Freire-Maia & Campos, 1989; Bawaskar & Bawaskar, 1994; Dehesa-Davila & Possani, 1994; Freire-Maia *et al*., 1994; Meki & Mohey El-Dean, 1998). Common symptoms include local pain, sweating, vomiting, restlessness, cardiac and respiratory arrhythmia, priapism, hyper- and hypothermia, hypo- and hypertension and pulmonary oedema. At least some of these responses are held to result from an initial cholinergic release from the parasympathetic nervous system subsequently overshadowed by extensive sympathetic stimulation and release of medullary and tissue catecholamines (Omran *et al*., 1992a, b; Dehesa-Davila & Possani, 1994; Ismail, 1994, 1995). There is evidence of enhanced levels of cytokines (Meki & Mohey El-Dean, 1998) and for the direct action of toxins on heart muscle, increasing the force of contraction (Omran *et al*., 1994; Teixeira *et al*., 2001). Where death is the outcome, heart failure, coupled with respiratory failure, is the proximal cause (Dehesa-Davila & Possani, 1994; Sofer *et al*., 1994).

Treatment of envenomed patients

Patients presenting with scorpion envenomation can be treated in two ways. Usually they are treated in medical centres at or after the time at which plasma concentrations of toxins have reached their peak. In cases of severe envenomation the toxins have already set in train a series of responses that can result in multiple organ failure (Gueron *et al*., 1993; Sofer *et al*., 1994). It is therefore paramount that the physiological consequences are counteracted with appropriate therapeutic drugs. All reports on patient treatment agree on this. There is a conflict of opinion however as to whether antivenom (AV) treatment is appropriate, clinically effective or cost effective.

Arguments in support of AV treatment

Krifi *et al*. (2001) have shown that in the absence of AV treatment the toxic fraction of the *Buthus occitanus tunetanus* (*Bot*) venom is eliminated from the circulatory system of rabbits in three phases which they describe as rapid, slow and very slow. For an initial dose of 75 µg/kg the elimination half-life was 135±10 m for *iv* applied venom, 112±16 m for SC application. Total body clearance took 520±60 m for *iv* application and 470±45 m for sc application. However when an adequate dose (12 mg $F(ab)_2$) was injected *iv*, body clearance for a 100 µg/kg dose was reduced to less than 50 m. The concentration of venom in the serum was assayed by ELISA.

Does the concentration of venom in the blood relate to the severity of the symptoms ? Rezende *et al*. (1998) and Krifi *et al*. (1998) have both noted a correlation between the severity of patient symptoms and the concentration of venom in the circulation, assessed by ELISA. Mild cases of envenomation had less than 2 ng/ml of circulating venom while moderate-severe cases had excess of 14 ng/ml. When 18 patients were treated with $F(ab)_2$ AV, venom was cleared from the circulatory system within 1 h and the patients' symptoms correspondingly reduced (Krifi *et al*., 1998). In a balanced assessment on the efficacy of AV treatment of 147 children by *Buthus occitanus tunetanus* (*Bot*) or *Androctonus australis garzonii* (*Aag*), Krifi *et al*. (1999) showed that *iv* application of bivalent $F(ab)_2$ AV more than halved the recovery time (18±8 h). The equivalent time for *im* application was 48±12 h. While all the children in this study were graded at clinical grade II (moderately) or clinical grade III (severely envenomed) the criteria for recovery were not given in this article.

The clinical case for employing *iv* $F(ab)_2$ or Fab AV treatment on severely envenomed patients appears to be clear. Pure fractions of $F(ab)_2$ AV raised against the toxic fractions of specific scorpion species significantly reduce the period of time for which venom can be detected in the serum in patients or animal models. The reduction in ELISA-assessed venom in the circulation is correlated with reversal of envenomation symptoms displayed by the patient.

The case against AV treatment

Although the concentration of circulating venom is reduced by AV, there is not universal agreement that this sufficient to improve patient outcome. Initially, low purity, high molecular weight polyvalent antibodies and the presence of antibodies raised to non-toxic fractions of scorpion venom reduced the potential of AV to annul scorpion toxins (Calderon-Aranda *et al*., 1993; Ismail, 1995) as well as increasing the chances of inducing acute allergic reactions, including anaphyllaxis and serum sickness (Sofer *et al*., 1994). In addition, AV treatment is expensive. The annual direct and indirect costs of providing AV therapy in Tunisia have been estimated to be one million US dollars, with 80% of the costs attributed to purchase and supply of AV (Abroug *et al*., 1999). The cost of a drug is not an argument about its efficacy but high costs sharpen critical assessment of its clinical efficacy. In a matched pair retrospective trial, Sofer *et al*. (1994) showed that the clinical outcome of AV-treated children was no better than when AV treatment was withheld. Their study showed that the frequency of cardiovascular disturbance was not significantly lower in children treated with AV. The duration of hospitalisation for the NAV (i.e. no AV) group was 2.83 d,

that for the AV-treated group is not significantly shorter at 2.75 d (n = 52). Gueron & Ilia (1999) remind us that respiratory difficulties and pulmonary oedema persist 24-48 h in patients treated with AV. Recently Abroug *et al*. (1999) reported on a blind, randomised trial carried out with 825 patients over 10 y. Half the patients were treated with twice the normal dose of bivalent *Aag* or *Bot* $F(ab)_2$ AV while the control half were treated with 20 ml saline. Supplementary treatment was administered at the discretion of the attending physician. The severity grades in the two groups at the start of treatment were similar. Median time between being stung and admission was 30 m. There was no difference in initial symptoms between the two groups though 4 patients in the AV group suffered an anaphylactic reaction. AV was administered by *iv* injection. This trial concluded that there was no benefit in routine administration of AV irrespective of clinical severity. Curative and preventative outcomes, mortality and the necessity for mechanical ventilation were the same in both groups.

If AV significantly reduces the half life of venom in the circulatory system can we explain why in some trials (Sofer *et al*., 1994; Abroug *et al*., 1999; Belghith *et al*., 1999) AV treatment fails to deliver a clinical benefit ?

Scorpion venom, though injected subcutaneously, quickly disperses round the body. ^{125}I-labelled *L. quinquestriatus* venom accumulates in the tissues much faster and at higher concentrations than even $F(ab)_2$ or Fab antibodies. The immunoglobulin fractions accumulate in the blood, the venom in the tissues (Ismail & Abd-Elsalam, 1998). SC injections of *B. o. tunetanus* venom, assayed by ELISA, could be detected in the blood within 2 m and reached peak concentrations in 44 m (Krifi *et al*., 2001). Santana *et al*. (1996) found a similarly rapid distribution of *Tityus serrulatus* venom. At equilibrium, 75% of injected venom is in the tissue compartment with the highest concentrations in the kidneys, lung and heart (Ismail, 1995). Rapid distribution of venom occurs because the toxin molecules are small, compact molecules. The clinical consequences are, as Ben-Abraham *et al*. (2000) remind us that though "AV treatment clears venom from the serum (it) will not abort the clinical effects already initiated".

A new approach

Bang *et al*. (1976), in their study of the Greenland Inuit, were the first to make a connection between dietary intake of marine vertebrates and the low incidence of coronoary heart disease (CHD). Their observations spawned a huge interest in the relationship between dietary intake of polyunstaturated fatty acids (PUFA's) and reduction of CHD. Polyunsaturated fatty acids are designated by a numerical formula which gives the number of carbon atoms in the molecule, the number of double bonds between carbon atoms and the position of the first double bond from the ω end of the molecule. Thus the formula for linolenic acid which has 18 carbon atoms and three double bonds, of which the first connects the third carbon atom from the ω end of the molecule to the fourth, is C18:3 (n-3) or C18:3 ω3. Dietary intake of 200–400 g of fish in men who had suffered one myocardial infarction was shown to produce a 29% reduction in 2 year all-cause mortality (Burr *et al*., 1989) and was correlated with a measurable improvement in survivorship after only 57 days. Several studies have since confirmed a reduction in mortality for patients whose diet is supplemented by PUFA's, including the large GISSI-Prevenzione trial. This assessed the effect of daily intake of

850-882 mg of eicosapentaenoic acid (EPA: C20:5 (n-3)) and docosahexaenoic acid (DHA: C22:6 (n-3)) in a ratio of 1:2 on 11,324 patients who had survived one, recent, myocardial infarction (GISSI-Prevenzione Investigators, 1999). The rate of death, non-fatal myocardial infarction and stroke was significantly reduced. EPA and DHA are both long chain ω3 fatty acids derived from marine fish.

While the mechanism of ω3 LC-PUFA's in reducing CHD is debated (GISSI Prevenzione Investigators, 1999), it has become clear that at least one action of PUFA's is to modify the electrical excitability of heart cells. Kang & Leaf (1994) showed that EPA and DHA at 2-10 µM significantly reduced the frequency of contraction of spontaneously beating isolated rat neonatal cardiac myocytes. Linoleic acid (C18:2 (n-6)) and linolenic acid (C18: n-3) had similar effects though were less potent. Kang *et al*. (1995) showed that cardiomyocytes exposed to 10 µM EPA became hyperpolarised with a consequent increase in the strength of the depolarising current required to elicit an action potential and an increase in the cycle length of excitability. As was the case for contraction frequency, other PUFA's, including DHA, linolenic acid, linoleic acid and arachidonic acid, had similar effects. In contrast saturated or monounsaturated fatty acids neither slowed the rate of isolated myocyte beating nor hyperpolarised the myocytes (Kang & Leaf, 1994; Kang *et al*., 1995).

In whole animals injection of EPA and DHA emulsions have been shown to prevent ischaemia-induced cardiac arrythmias (Billman *et al*., 1994). More recently, Brouwer *et al*. (2002) have demonstrated a positive correlation between heart rate variablity, a risk predictor for mortality and arrythmia, and plasma content of DHA but not EPA in healthy volunteers.

Free polyunsaturated fatty acids slow the rate at which cardiac myocytes beat by attaching to voltage-sensitive Na^+ channels (Kang & Leaf, 1996). PUFA's which slow myocyte beating, including EPA, DHA, eicosatetranoic acid (ETYA), linolenic acid and linoleic acid, inhibit binding of a batrachotoxin-based toxin. Kang & Leaf (1996) deduced that both the unsaturated C-C bonds and the charged carboxyl group are necessary to realise these effects and that the PUFA binds to a specific receptor site on the Na^+ channel, prolonging the refractory period by binding to and stabilising the channel in its inactivated state.

We noted that consumption of olive oil is a common Bedouin remedy applied after scorpion envenomation (Table 4). The main constituent of olive oil is oleic acid (C18:1 (n-9)) which makes up 62.1% of the constituents (McLennan & Dallimore, 1995) which has no antiarrythmic properties (Kang & Leaf, 1994; Kang *et al*., 1995) but olive oil does contain 12.7% linoleic acid (C18:2 (n-6)) and 1.1% linolenic acid (C18:3(n-3)) both of which have antiarrythmic effect on neonatal rat cardiac myocytes (Kang & Leaf, 1994). A study by de Logeril *et al*. (1994) showed that α-linolenic acid, like the α3 PUFA's derived from fish oils, gives protection against CHD, though some of this protection in humans may result from conversion of α-linolenic acid to EPA (McKeigue, 1994).

In view of the effect of PUFA's in lowering mortality through CHD, slowing the beating of cardiac myocytes *in vitro* and protecting *in situ* hearts against arrythmia and the widespread use of olive oil by Sinai Bedouin after scorpion envenomation, we suggest that the potential protective effect of PUFA's to stabilise heart rate and

neuronal activity in autonomic ganglia after scorpion envenomation should be investigated. The advantage of PUFA's is that they can be administered to groups at risk, such as small children, as a precautionary measure without the close supervision of medical staff. McKeigue (1994) points out that administering fish oil to a sizeable community is an implausible and expensive task. However plant oils, which are rich in C18:3 (n-3) PUFA's might confer protective benefits against scorpion envenomation at relatively low cost.

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Appendix 1

Publication	Location	Species*	Period	Number			AV	Mortality			
				Adults	Children	Total afflicted		Adults	Children	Total	% total
Mundle, 1961	Kolaba district, Bombay		14 y			78	*r*	9	14	23	29.5
Habermehl, 1981	Algeria	*Buthus occitanus*	1942 – 1958	14,542 = 909 *py*	5,622 = 351 *py*	20,164 = 1260 *py*		163 = 10 *py* or 1.12%	223 = 14 *py* or 4%	386 = 24 *py*	1.9
	Belo Horizonte, Brazil	*Tityus* spp.	1935			2,449				145	5.8
	Ribiero Preto, Brazil	*Tityus* spp.	1945 – 1950			985	Some			7	0.7
	Sao Paulo, Brazil	*Tityus bahiensis* *Tityus serrulatus*	1954 – 1965			1.277				2	0.16
	Trinidad		1929 – 1933			698		0.8 – 1.4 %	School children 3 - 5 %, babies & small children 15 - 20 %		
	India	*Heterometrus* spp.	< 14 y			75		9	14	23	30.7
Calderon-Aranda *et al*., 1993	Mexico					200,000 *py*	Most			700 - 800 *py*	0.35 - 0.4
Bawaskar & Bawaskar, 1994	Mahad, India	*Mesobuthus tamulus*				163	*r*		1		0.6
Freire-Maia *et al*., 1994	Brazil	*Tityus serrulatus*	1972 – 1987	2822 73%	1038 27%	3860 = 241 *py*	*a* Fab_2	0	1%		0.28
Ismail, 1994	18 health regions in Saudi Arabia	*L. quinquestriatus* *A. crassicauda*	1.5 y			24,000 = 16,000 *py*	*a* *p.v.*			1200	0.05
	Al-Baha, Saudi Arabia	*L. quinquestriatus*				1033	*a* *p.v.*			0	0
	Al-Qassim, Saudi Arabia	*A. crassicauda*				791			1		0.13
Dehesa-Davila & Possani, 1994	Leon, Mexico		1982 – 1988			61001 = 10167 *py*				1788 = 298 *py*	2.9

Publication	Location	Species*	Period	Number			AV	Mortality			
				Adults	Children	Total afflicted		Adults	Children	Total	% total
Dehesa-Davila & Possani, 1994	Leon, Mexico	*Centruroides* spp.	12 y			96,436 = 8036 *py*	*a* *p.v.*			0	0
Sofer *et al*., 1994	Israel				104		52 *a* 52 *r*			2 0	3.5
Ismail, 1995	Al-Riyadh, Saudi Arabia	*A. crassicauda* *L. quinquestriatus*	Jan-Oct 1992	163	60	223 = 612 *py*	*a* *p.v.*	0	0	0	0
Krifi *et al*., 1996	Tunisia	*A. australis garzonii* *Buthus occitanus tunetanus*	1986 – 1992			30,000 - 45,000 *py*			Most deaths were among children	35 - 105 *py*	0.12 – 0.23
Meki & Mohey El-Dean, 1998	Egypt				38				3		7.9
Rezende *et al*., 1998	Brazil	*Tityus serrulatus*				3860	*a* Fab_2				0.28
Abroug *et al*., 1999	Tunisia	*A. australis garzonii*	Oct 1994 – Nov 1995			825 = 762 *py*	412 *a* *p.v.*			1	0.24
		Buthus occitanus					413 *r*			1	0.24
Krifi *et al*., 1999 (1)	Tunisia		1993 – 1997		147 <15 y	147	*a* *im*, *iv*				
Krifi *et al*., 1999 (2)	Tunisia		1986 – 1997			35,000 - 45,000 *py*				13 - 105	
Belghith *et al*., 1999	Tunisia					600	135 *a* Fab_2 465 r			1 0	0.7 0
Ben-Abraham *et al*., 2000	Israel	*L. quinquestriatus*			18		*a*		3		0
Ghalim *et al*., 2000	Morocco	*A. mauretanicus* *Buthus occitanus*				275	*a*				

Abbreviations: *a* = antivenom given, *im* = intramuscular, *iv* = intravenous, *p.v.* = polyvalent, *py* = per year, *r* = antivenom not given, y = year
* *A. = Androctonus, L. = Leiurus*

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Revision of the North African spider genus *Dorceus* C.L.Koch, 1846 (Araneida: Eresidae)

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Abstract

The eresid genus *Dorceus* is revised and five species from North and West Africa are recognized and distinguished in a key. All the existing type specimens were examined and all species are redescribed. Scanning electron microscopy was used in the examination of male palps. A distribution map for each species is provided based on verified literature distribution records. The transfer of *Eresus albopictus* to *Dorceus* is rejected. New synonyms are: *D. caniceps* Simon, 1910 = *D. fastuosus* C.L.Koch, 1846; *D. eburneus* (Simon, 1876) = *D. latifrons* Simon, 1873.

Keywords: Eresidae, *Dorceus*, North Africa, Taxonomy, Spiders.

Introduction

Dorceus C.L.Koch, 1846 is the second described genus after *Eresus* Walckenaer, 1805 in the history of family Eresidae C.L.Koch, 1851. The family currently includes 10 genera, 103 species, and 7 subspecies which are distributed throughout the Ethiopian, Mediterranean, Oriental, and Palaearctic regions as well as Brazil (Platnick, 2002).

Dorceus was first described by Koch (1846) to accommodate *D. fastuosus*. He described a male from Senegal and provided a beautiful drawing for it. After 27 years, Simon (1873a) described a second species, *D. latifrons*, based on a dry female specimen from Algeria. At the same time, he described two *Eresus* species from Sicily and Algeria under the names *E. albopictus* and *E. lucasi* respectively. The second species was later synonymized by Roewer (1954) with the first one and transferred by Lehtinen (1967) to genus *Dorceus*. Simon described the remaining species of *Dorceus* between 1876-1910. Species recognition was mainly based on

colour patterns, a character found to be variable amongst the eresids (Kullmann *et al*., 1972). Simon (1910) provided a key to the males of *Dorceus*, separating them into two groups based on the colour pattern on the cephalic part of the cephalothorax. He could not find enough material to study and separate the females too.

Roewer (1954) listed 8 species of *Dorceus*: 6 from the Palaearctic region and 2 from the Ethiopian region. This was confirmed by Platnick (2002) who also listed 8 species from Morocco, Algeria, Tunisia, West Africa, Senegal, and Egypt. Lehtinen (1967) provided two drawings of male palpal organs of *D. eburneus* Simon, 1876 and an undescribed species from Central Africa. The most recent information on *Dorceus* was provided by El-Hennawy (1998), with the redescription of the male of *D. quadrispilotus* Simon, 1908 from Egypt. Near the end of the second millennium, some eresid genera were revised: *Stegodyphus* Simon, 1873 by Kraus & Kraus (1988), *Penestomus* Simon, 1902, *Wajane* Lehtinen, 1967 and *Seothyra* Purcell, 1903 by Dippenaar-Schoeman (1989 & 1990). *Dorceus* with its few species deserves revision.

Methods

The type material of the known species were examined. The right palp of a male of each species was photographed and examined by scanning electron microscope (Jeol JSM-5400). The abdominal patterns of males were drawn. Epigyna and vulvae of the three known female specimens were examined and photographed. Measurements of the different species were taken in millimetres for comparison.

The distribution of *Dorceus* species was summarized from the literature. The names and coordinates of geographical localities were verified using the Royal Military College Atlas (Anon, 1928), The Arab Atlas (Anon, 1968), Nordafrika map (Anon, 1983), and National Geographic Society's Atlas of the World (Anon, 1996) and plotted on a map.

Abbreviations used: ALE = anterior lateral eye; AME = anterior median eye; L = length; LOQ = lateral ocular quadrangle; MOQ = median ocular quadrangle; PLE = posterior lateral eye; PME = posterior median eye; TL = total length; W = width.

Material from the following collections were examined: CHE = H.K.El-Hennawy private collection, Cairo, Egypt; MHNG = Muséum d`histoire naturelle, Genève, Switzerland; MNHN = Muséum National d`Histoire Naturelle, Paris, France; OMNH = Oxford University Museum of Natural History; ZMHB = Museum für Naturkunde, Zentralinstitut der Humboldt-Universität zu Berlin, Germany.

There is no collected material of genus *Dorceus* in the following museums, which answered my inquiries: Naturhistorisches Museum Wien (Dr. Jürgen Gruber); The Natural History Museum, London (Dr. Janet Beccaloni); American Museum of Natural History (Dr. Norman I. Platnick). The internet search facilitated but yielded the same result with the following museums: Institut royal des Sciences Naturelles de Belgique; National Museum of Natural History, Smithsonian Institution; Staatliches Museum für Naturkunde Karlsruhe; Zoological Museum, University of Copenhagen.

Systematics

Genus ***Dorceus*** C.L.Koch, 1846

Dorceus fastuosus C.L.Koch, 1846: 15-16.

Dorceus C.L.Koch, 1850: 70. Simon, 1864: 300; 1892: 254; 1910: 290. Lehtinen, 1967: 231, 389. El-Hennawy, 1998: 97.

Type species: *Dorceus fastuosus* C.L.Koch, 1846. By monotypy.

Diagnosis: *Dorceus* and the closely related *Seothyra* can be distinguished from other eresid genera by their short posterior spinnerets which are half the length of the anterior ones and the cylindrical, widely spaced anterior spinnerets which are strongly conical in other genera. The two genera differ mainly in the shape of the cephalothorax where the cephalic part is nearly as long as wide in *Seothyra*, and reverse trapezoidal in *Dorceus*; the size of the eyes are equal or subequal in *Seothyra*, while the PME are larger than the rest in *Dorceus*; the development of the front legs which are usually thicker than the others, especially in males of *Seothyra* compared to *Dorceus* where almost all the legs are of equal thickness (Simon, 1903; Lehtinen, 1967; Dippenaar-Schoeman, 1990).

Description: Total length (in mm): Male: 5-14, Female: 12-13. Cephalothorax: Cephalic part: wider than long, higher than thoracic part; posterior edge semi-circular in shape, abruptly inclined towards thoracic part. Eyes: PME largest; other eyes subequal or equal in size; PME less than 1.5 times AME (1.18-1.43); AME widely separated in females, and narrower in most males; MOQ wide trapezoidal, narrower anteriorly, sometimes slightly protruding forwards; lateral eye area reverse trapezoidal slightly wider anteriorly; ALE directed laterally and downwards. Clypeus: very narrow, sometimes with a small lip-like protrusion between chelicerae. Thoracic part: almost flat, slightly inclined posterior to cephalic part; fovea vary from small and circular, to wide and deep, situated just behind incline of cephalic part. Chelicerae: with big tooth on inner edge fitting against fang; with strong boss. Male palp: without tibial or patellar apophyses; female palp with toothed claw. Abdomen: oval, overlapping cephalothorax; variable abdominal pattern present only in males. Spinnerets: anterior spinnerets thick, cylindrical, widely spaced; posterior spinnerets flattened, very short, half the length of the anterior ones; median spinnerets smallest, quite vestigial. Cribellum: bipartite. Leg formula IV-I-II-III; Leg I L : Cephalothorax L 2-2.7 in males, 1.4-1.8 in females; leg spination: spines usually ventral on tibiae, metatarsi and tarsi I-IV in males and III, IV in females; tarsi with three claws, two uniserrated and one smooth; in males, legs covered by orange, brown, black and white patches; calamistrum absent from metatarsus IV of males.

Distribution: The distribution of *Dorceus* species is confined to the range: 29°17'E-17°00'W, 14°40'N-35°21'N, from North Africa and Senegal (Fig. 31).

Habitat: The habitat of *Dorceus* ranges from relatively humid regions near sea level on the Mediterranean or Atlantic coast to coastal desert regions, at most 220 km from the coast.

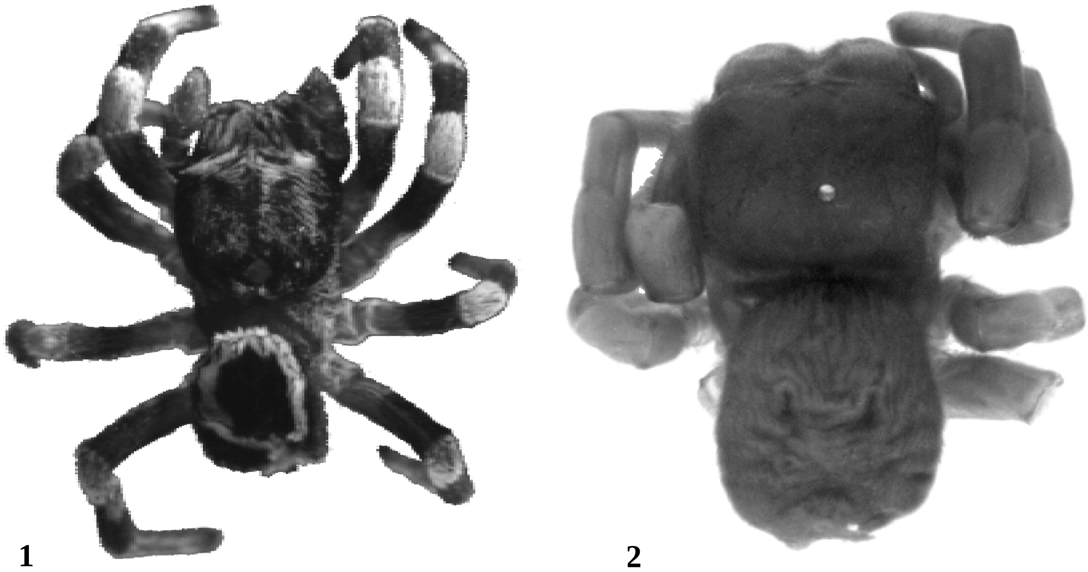
Key to *Dorceus* species

Males

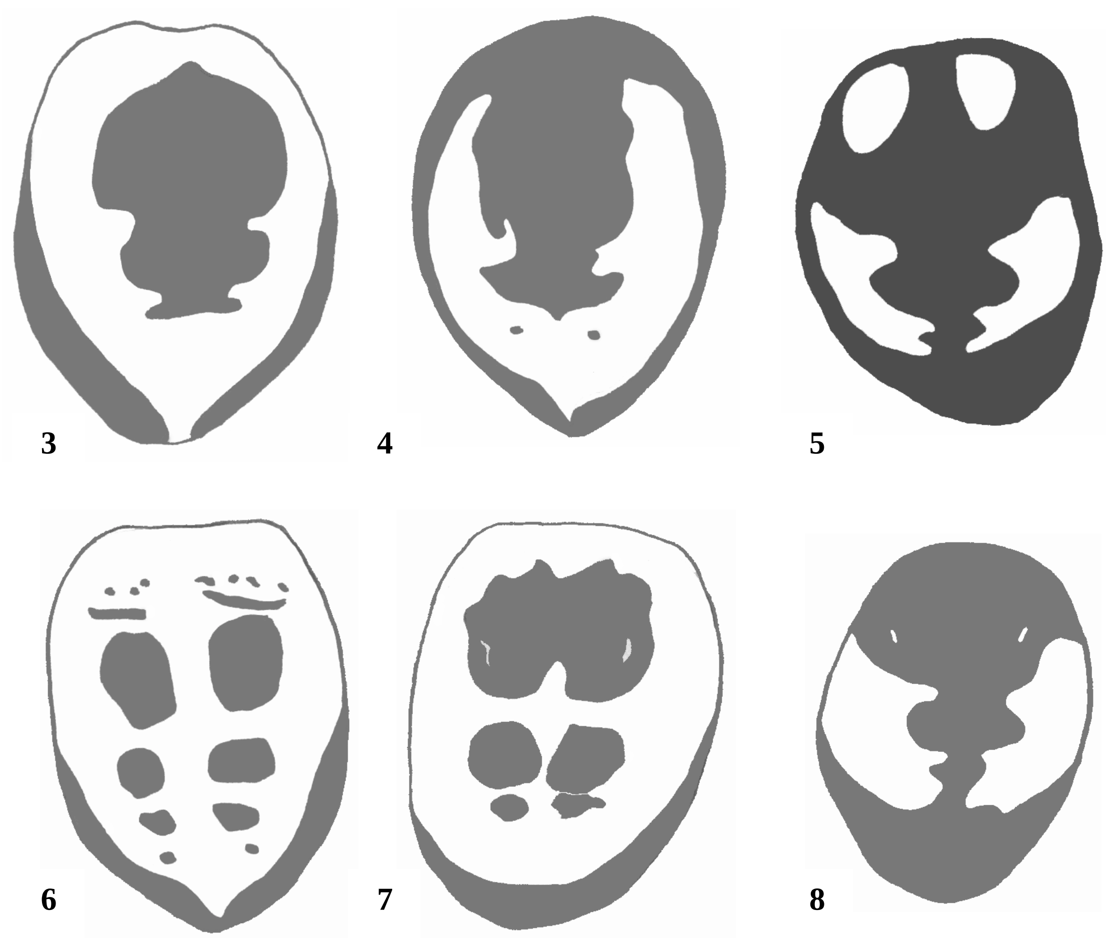
1. Cephalic part covered by black hairs except for two white spots on anterior third and two smaller spots just before PLE. Tibiae I, II without ventral spines. Abdomen dorsally covered by black hairs, except for "African mask" abdominal pattern (Fig. 5). Palp with terminal element of conductor screw-shaped, with two projections seen together from ventral side (Fig. 26). Egypt…………….………….…*D. quadrispilotus*

-. Cephalic part covered by white hairs. Tibiae I, II with ventral spines……….….…2

2. Cephalic part covered by white hairs except a triangle-shaped pattern with its base between the PLE and its apex just behind the MOQ, as well as anterior and lateral edges, covered by brown hairs. Integument yellow. Abdomen dorsally covered by



Figures 1-2. Habitus of two *Dorceus* holotypes. 1. *D. fastuosus* ♂. 2. *D. latifrons* ♀.



Figures 3-8. Abdominal patterns of *Dorceus* males. 3,4. *D. fastuosus* (4. Type of *D. viberti*); 5. *D. quadrispilotus*; 6-7. *D. latifrons*; 8. *D. trianguliceps*.

brown hairs, except two white areas on both sides (Fig. 8). Palp with terminal element of conductor L-shaped retrolaterally (Fig. 28). Tunisia……...............*D. trianguliceps*
-. Cephalic part without triangle-shaped area. Integument crimson red……………....3

3. Abdomen with brown median pattern (Figs. 3, 4) in form of a plant leaf (or a spade card) with two continuous lobes. Palp with terminal element of conductor hook-shaped retrolaterally (Figs. 16, 19). Senegal, Tunisia……….………..…*D. fastuosus*
-. Abdomen with a pattern consisting of spots, six arranged in three pairs, preceded by a few anteriorly and smaller scattered spots, all covered by brown hairs (Figs. 6, 7). Palp with terminal element of conductor divided (Fig. 22). Algeria, Tunisia……………………………………………………………….…..*D. latifrons*

Note: *D. albolunulatus* male is not included in the key. It is only known from original description which is not sufficient.

Females: Only the female of *D. latifrons* is known.

Description of *Dorceus* Species

Dorceus albolunulatus (Simon, 1876)

(Fig. 31)

Eresus albolunulatus Simon, 1876: 86.
Dorceus albolunulatus Simon, 1910: 293.

Note: The original description of this species was based on a female specimen (Simon, 1876). However a modification of the description was published by Simon (1910), and the holotype was then identified as a male *Dorceus* specimen. The description corresponds with that of a male having the typical abdominal pattern found in *Dorceus*. Unfortunately, the tube no.1825 holding the type material from NE Algeria, requested from MNHN was found empty. Therefore, only the description of Simon is available here for comparison with other species.
Description: Male (based on description of Simon (1910): TL 6 mm. Cephalothorax black, bearing grey bristles dorsally and whitish hairs posteriorly; cephalic part low, wider than long, posteriorly slightly inclined; median eyes unequal, arranged in transverse trapezium. Abdomen black, with white transverse strongly curved band anteriorly, and similar band posteriorly but curved in opposite direction; medially with two white indentations disposed between bands. Legs short, femora entirely black, patellae and tibiae tawny, metatarsi and tarsi yellowish red, with scattered white hair.

Distribution: Algeria (Type locality): Biskra 34°51'N 05°44'E, about 220 km from seacoast (altitude 121 m), (Taczanowski) (examined by Simon, 1876, 1910) (Fig. 31).

Dorceus fastuosus C.L.Koch, 1846 (Type species)

(Figs. 1, 3-4, 11, 15-20, 30-31. Table 1)

Dorceus fastuosus C.L.Koch, 1846: 15-16, pl.435, fig.1088; 1850: 70. Simon, 1886: 366; 1892: 254.
Erythrophora fastuosus Simon, 1864: 300.
Dorceus caniceps Simon, 1910: 291. NEW SYNONYMY.
Dorceus viberti Simon, 1910: 292. Lehtinen, 1967: 231 (synonym).

Dorceus canicipiti Simon, 1910: 294. Roewer, 1954: 1291. NEW SYNONYMY.

Material examined: ZMHB: *Dorceus fastuosus*, Holotype ♂, Senegal, Mian, Kat.-Nr. 1527. MNHN: *Dorceus fastuosus* C.L.Koch, tube no.1237 (AR5405) 3 ♂ from Senegal: Dakar; *D. viberti* E.Simon, tube no.9126 (AR5404) 1 ♂, 1 ♀ from Tunisia: Nefzana (Vibert) (may be Nefza ?)[♀ Misidentified]. OMNH: 1 ♂ *Dorceus fastuosus* B.510, Algeria, Lord Walsingham 1903.

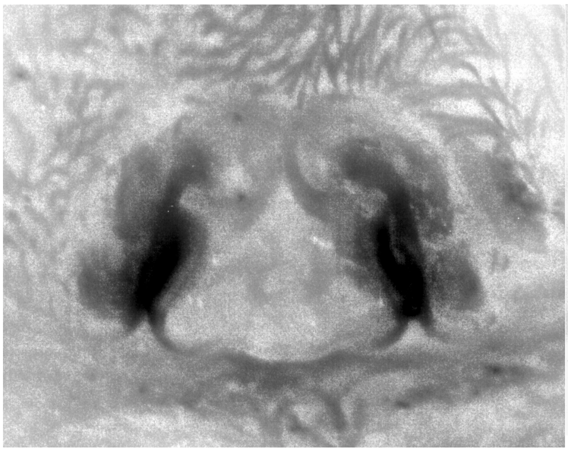
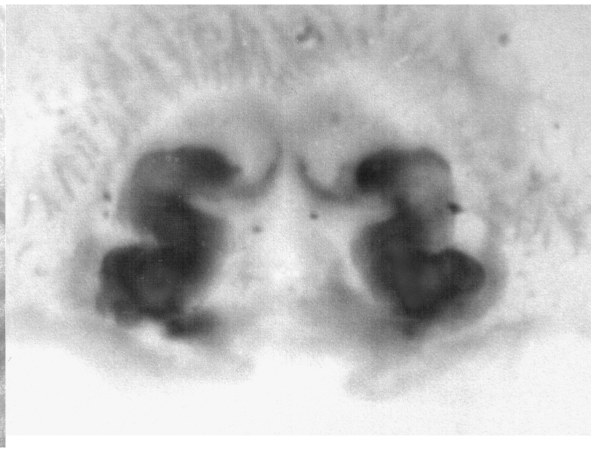
Note: The holotype (Fig. 1) is a dry pinned specimen. Therefore, the measurements of the biggest specimen of 3 ♂ of MNHN were taken. The description is a combination of this specimen and the holotype.

Description: Male (MNHN): TL 7.82. Cephalothorax: L 4.14. Cephalic part: L 2.76, W 3.18. Integument crimson red, covered by short white hairs; posterior and lateral edges very dark, covered by yellowish hairs. Eye measurements: AME 0.14, ALE 0.14, PME 0.17, PLE 0.12, AM-AM 0.12, AL-AL 2.31, PM-PM 0.37, PL-PL 1.94, AM-AL 0.99, AM-PM 0.03. Thoracic part: L 1.38, W 3.07. Colour as in cephalic part. Fovea wide. Chelicerae: crimson red, covered by dense white and yellowish white hairs anteriorly, nearly bare posteriorly in parts adjacent to labium and maxillae; internal side black. Sternum L 2.23; yellowish brown, covered by sparse white to yellowish white hairs. Labium L 0.85, Maxilla L 1.27; reddish brown, covered by sparse white to yellowish white hairs; their tips white. Pedipalps: tibia ventrally covered by long white hairs; other segments covered by pale brown hairs. Palpal organ (Figs. 11, 15-17 *fastuosus*; 18-20 *viberti*): terminal element of conductor is hook-shaped retrolaterally (Figs. 16, 19). Legs: yellowish brown, covered by white and brown hairs. Coxae: yellowish brown, covered sparingly by white to yellowish white hairs. Femora: proximal 1/3-1/2 white, distal 2/3-1/2 brown; Patellae and tarsi white; Tibiae brown; Metatarsi: I, II proximal 2/3 white, distal 1/3 brown, II, IV all white. Tarsi: tip flattened; with a claw tuft. Spination pattern: only ventral on tibiae, metatarsi and tarsi I-IV. Leg I: tibia 0-0-2; metatarsus 0-0-1-4; tarsus 0-1-1-3. Leg II: tibia 0-0-2-0(2); metatarsus 0-1(2)-4-4; tarsus 0-4-4. Leg III: tibia 0-1-2-3; metatarsus 0-4-2-7(6); tarsus 0-3-6. Leg IV: tibia 0-2(0)-3(1)-5(4); metatarsus 0-3-4-3-3-3-7; tarsus 0-1-3-4-7.

Table 1. Leg measurements of *Dorceus fastuosus* male.

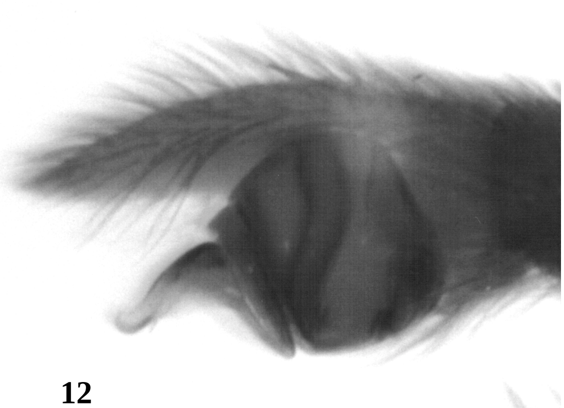
Leg	I	II	III	IV
Femur	2.55	2.45	2.04	2.89
Patella	1.53	1.19	1.19	1.50
Tibia	1.60	1.53	1.19	1.90
Metatarsus	1.53	1.39	1.36	1.84
Tarsus	1.19	1.09	0.78	0.99
Total length	8.40	7.65	6.56	9.12

Abdomen: L 4.61; whole dorsal area covered by thick white hairs, medially with brown abdominal pattern (Fig. 3) in form of a plant leaf (or a spade card), with two continuous lobes, posterior lobe smaller with slim base; the pattern covers muscle attachment points; outer border of abdomen covered by brown hairs except vicinity of spinnerets covered by white and yellow hairs; ventrum covered by brown hairs, except for creamy white area above the book-lungs and posterior of genital furrow; cribellum: small, bipartite. [Note. The abdominal pattern variable: circular in the holotype, maybe due to dryness (Fig. 1), and it varies too in the *D. viberti* type (Fig. 4).]

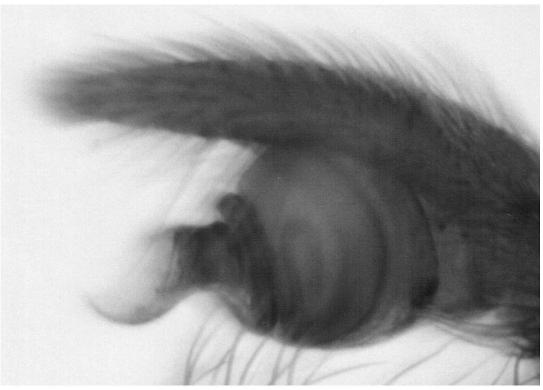



9 **10**

Figures 9-10. Epigynum (9) and vulvae, dorsal view (10) of *Dorceus latifrons* ♀.
(A specimen formerly considered *D. eburneus*).

11 **12**




13 **14**

Figures 11-14. Palpal organs of *Dorceus* males, prolateral view. 11. *D. fastuosus*; 12. *D. latifrons*; 13. *D. quadrispilotus*; 14. *D. trianguliceps*.

Measurements of the holotype (ZMUB) and the two other male *D. fastuosus* and male *D. viberti* (MNHN) specimens: TL 5.1, 7.14, 6.80, 8.85; cephalic area L 2.21, 1.70, 2.89, 2.81, W 2.47, 2.81, 3.23, 3.29; abdomen L 2.21, 3.40, 3.40, 5.03.
Female: unknown.

Distribution: Senegal: Dakar 14°40'N 17°00'W, on Atlantic ocean coast (Simon, 1886, 1910). **Tunisia**: *Dorceus viberti*, Nefzaua (Vibert) (Simon, 1910), may be Nefza (Djebel Abiod) 37°00'N 09°03'E, about 15 km from seacoast (Fig. 31).

Notes: 1. Simon (1886) described *D. fastuosus* specimens from Senegal. Simon (1910: p.291 note) indicated them to be misidentified and renamed them as *D. caniceps*, which was mentioned in p.294 as *D. canicipiti*. Those three specimens were examined here (MNHN) and synonymized with *D. fastuosus*. No specimens carrying the name *D. caniceps* or *D. canicipiti* were found in the MNHN collection.
2. The male *Dorceus fastuosus* B.510, Algeria, Lord Walsingham 1903 (OMNH) does not belong to genus *Dorceus*. It is an *Eresus* species. The ratio between length and width of cephalic part and width of thoracic part (Fig. 30) elucidates this. It is obvious in this figure that the specimen of Oxford is different from other *Dorceus* males. It was misidentified.

Dorceus latifrons Simon, 1873
(Figs. 2, 6-7, 9-10, 12, 21-23, 30-31. Tables 2-3)

Dorceus latifrons Simon, 1873a: 160-161, pl.3, figs.26-27; 1910: 294.
Eresus eburneus Simon, 1876: 86. NEW SYNONYMY.
Dorceus eburneus Simon, 1885: 20-21; 1892: 249, fig.205; 1910: 292. Lehtinen, 1967: 461, fig.464. NEW SYNONYMY.

Material examined: MNHN: *Dorceus latifrons*, tube no.1826 (AR5400) 1 ♀ from Algeria; *Dorceus eburneus*, tube no.1209 (AR5402) 6 ♂, 1 ♀, 1 s ♀, Tunisia: Beni Saudu ? (Algeria: Bou Saâda). *D. viberti*, tube no.9126 (AR5404) 1 ♀ from Tunisia: Nefzana (Vibert) (may be Nefza ?). MHNG: *Dorceus eburneus* 1 ♂, Tunisie, coll. H. de Saussure.
Note: The holotype (Fig. 2) is a dry pinned specimen. Therefore, the measurements of the female and the biggest male specimens of MNHN were taken. The description is a combination between these specimens and the holotype.
Description: Female (MNHN tube no. 1209 (AR 5402)): TL 12.92. Integument: cephalic part, metatarsi & tarsi I, II, palps and chelicerae reddish brown; anterior edge of cephalothorax dark; thoracic part and legs orange brown; labium, maxillae, sternum and coxae lighter than legs. Cephalothorax: L 5.95. Cephalic part: L 3.57, W 4.50; rectangular. MOQ slightly protruding forwards. Eye measurements: AME 0.13, ALE 0.13, PME 0.18, PLE 0.14, AM-AM 0.21, AL-AL 3.23, PM-PM 0.56, PL-PL 3.18, AM-AL 1.43, AM-PM 0.08. Thoracic part: L 2.38, W 4.25. Fovea small. Chelicerae: with big tooth (cusp) internally; tooth with three black denticles on the side facing the fang. Sternum L 3.34; Labium L 1.17; Maxilla L 1.80, maxillae covered by dense brownish hairs. Pedipalps with stiff bristles, ventrally on tarsus, prolaterally on metatarsus and tarsus (longer setae). Legs without scopula; with long bristles concealing claws. Metatarsus IV with calamistrum, of a single row of short bristles situated about 2/3 on segment retrolaterally. Tarsi: tip thickened, laterally pressed; with weak scopula. Spination pattern: only ventral on tibiae, metatarsi and tarsi III, IV. Leg III: tibia 0-0-2distal; metatarsus 0-2,1-4; tarsus 0-1-4. Leg IV: tibia 0-0-1pro, distal; metatarsus 0-2,3,3-2,5 mostly prolateral; tarsus 0-1,3,3-1,4 (left metatarsus 321225; tarsus 0-214).

Table 2. Leg measurements of *Dorceus latifrons* female.

Leg	I	II	III	IV
Femur	3.31	3.06	2.46	3.48
Patella	1.70	1.78	1.19	2.04
Tibia	1.78	1.61	1.19	2.29
Metatarsus	2.04	1.70	1.19	2.04
Tarsus	1.36	1.19	0.59	0.93
Total length	10.19	9.34	6.62	10.78

Abdomen: L 8.26; creamy white (above and below); covered by short dense creamy white hairs. Abdominal pattern absent. Cribellum: small bipartite (larger than in male).

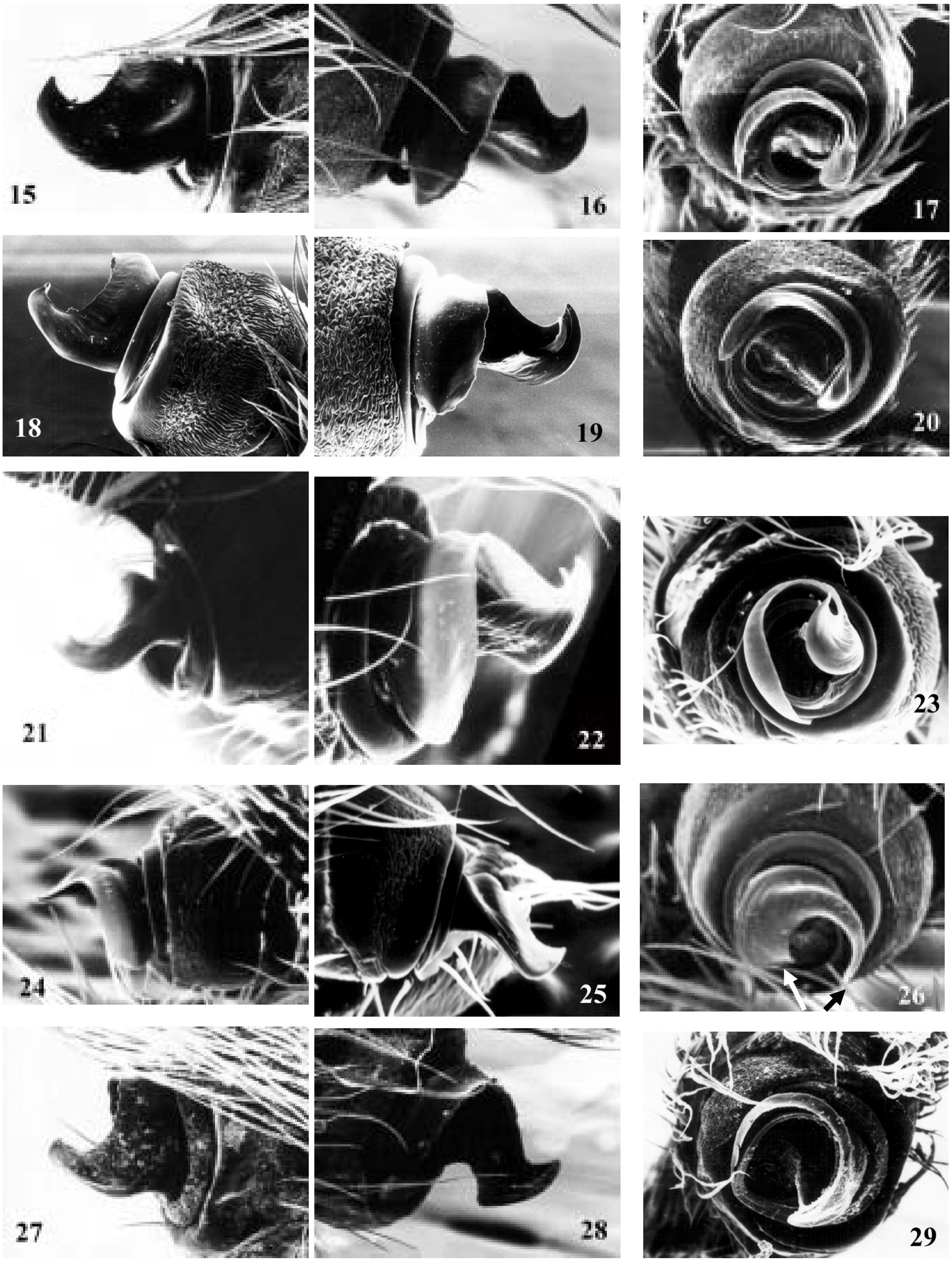
Genitalia: Among the three female specimens examined, the holotype *D. latifrons*, a dry pinned specimen was impossible to examine. The epigynum was removed and cleared. It was compared with that of the two other females which were formerly considered *D. eburneus* and *D. viberti* and found to be identical (Figs. 9-10). Hence, *D. eburneus* is here regarded as a junior synonym with *D. latifrons*. The female *D. viberti* (MNHN, tube no.9126 (AR5404)) is here identified as *D. latifrons*. It may be misplaced in the vial of the male *D. viberti* but does not belong to its species.

Measurements of the female holotype *D. latifrons*, female *D. viberti* and subadult female *D. eburneus* (MNHN): TL 11.56, 12.24, 10.2; cephalic area L 4.5, 3.74, 3.57, W 5.95, 4.42, 4.34; abdomen L 6.8, 8.24, 6.63.

Male (MNHN tube no. 1209 (AR 5402)): TL 14.06. Cephalothorax: L 5.41; integument crimson red; covered by white hairs mixed with pale brown hairs. Cephalic part: L 3.71, W 4.77. MOQ slightly protruding forwards. Clypeus: with a protrusion between chelicerae. Eye measurements: AME 0.14, ALE 0.12, PME 0.19, PLE 0.17, AM-AM 0.20, AL-AL 3.92, PM-PM 0.58, PL-PL 3.39, AM-AL 1.64, AM-PM 0.07. Thoracic part: L 1.70, W 3.99. Fovea circular. Chelicerae: crimson red, covered by long brown hairs anteriorly. Sternum L 6.93; Labium L 1.06; Maxilla L 1.80; sternum, coxae and pedipalps orange to brown; maxillae and labium strawberry red; all covered by pale brown hairs. Pedipalps: covered by long brown hairs. Palpal organ (Figs. 12, 21-23): with conductor terminally divided (Fig. 22). Legs: orange to brown, covered by pale brown hairs except: distal border of femur, distal half of patella, distal third of tibia and metatarsus, proximal third of tarsus covered by white hairs (less distinct on legs III, IV); both sides of metatarsus I covered by white hairs. Spination pattern: only ventral on tibiae, metatarsi and tarsi I-IV (numerous). Leg I: tibia 0-0-6distal; metatarsus 2-1,1,1-5; tarsus 2-2-1,2. Leg II: tibia 2,2,3-2-7; metatarsus 5-3-4-4-4-6; tarsus 5-4-6. Leg III: tibia 3-2-2-7distal; metatarsus 4-6-4-10; tarsus 3-4-3-4-5. Leg IV: tibia 3-3-3-4-3-11; metatarsus 50+6 distal; tarsus 3,4-4-4-6.

Table 3. Leg measurements of *Dorceus latifrons* male.

Leg	I	II	III	IV
Femur	3.97	3.71	3.44	4.03
Patella	1.96	1.70	1.43	2.01
Tibia	2.28	1.96	1.59	2.65
Metatarsus	2.38	2.01	1.70	2.65
Tarsus	1.48	1.27	0.95	1.22
Total length	12.07	10.65	9.11	12.56



Prolateral Retrolateral Ventral

Figures 15-29. SEM of palpal organs of *Dorceus* males, prolateral, retrolateral and ventral views. 15-20. *D. fastuosus* (18-20. Type of *D. viberti*); 21-23. *D. latifrons*; 24-26. *D. quadrispilotus*; 27-29. *D. trianguliceps*.

Abdomen: L 9.25; creamy white, covered by dense white hairs except outer border and abdominal pattern, which consists of six spots in three pairs, preceded by few spots near anterior edge of abdomen, and sparse smaller spots scattered in area of abdominal pattern, all covered by brown hairs (Figs. 6-7). Ventrally with dark greyish brown furrows behind genital furrow and on both sides; covered by pale brown hairs until spinnerets. Cribellum small. [MHNG specimen is faded, without abdominal pattern.]

Measurements of the other males (MNHN and MHNG): TL 8.5, 8.93, 8.5, 8.16, 6.8, 7.65; cephalic area L 3.32, 2.98, 2.64, 2.27, 2.21, 2.46, W 4.17, 3.66, 3.83, 3.57, 2.72, 3.18; abdomen L 5.10, 5.1, 4.76, 5.27, 4.25, 4.59.

Distribution: Female holotype: **Algeria**: Sahara, desert south of Algeria (without definite locality) (Simon, 1873a, 1910). *D. eburneus*: **Algeria**: Bou Saâda 35°12'N 04°11'E, about 190 km from seacoast (altitude 560 m)(Dr Ch.Leprieur), Hodna (Plaine du Hodna) 35°21'N 04°30'E, 160-180 km from seacoast, Biskra 34°51'N 05°44'E, about 220 km from seacoast (altitude 121 m) (Simon, 1876, 1885, 1910); **Tunisia**: Sfax 34°49'N 10°45'E, on seacoast; Gabès 33°53'N 10°04'E, on seacoast (V.May); Qasserine (Kasserine) 35°11'N 08°52'E, about 150 km from seacoast, Feriana 34°58'N 08°36'E, about 160 km from seacoast; Sbeita (? may be Sbeïtla) 35°14'N 09°05'E, more than 130 km from seacoast (Simon, 1885, 1910) (Fig. 31).

Dorceus quadrispilotus Simon, 1908

(Figs. 5, 13, 24-26, 30-31. Table 4)

Dorceus quadrispilotus Simon, 1908: 82-83. El-Hennawy, 1998: 97-100, figs. 1-5.
Dorceus quadrispilota Simon, 1910: 293-294.

Material examined: MNHN: *Dorceus quadrispilotus*, tube no.8348 (AR5406) 3 ♂ from Egypt: Alexandria (Letourneux): Holotype and 2 paratypes. CHE: H.K.El-Hennawy collection, Cairo, Egypt. 1 ♂ 11 May 1990, about 6 km west of El-Hammam (about 40 km west of Lake Mariout, west of Alexandria, the type locality) about 30°49'N 29°17'E.

Description: Male (CHE): TL 6.11. Cephalothorax: L 3.24. Cephalic part: L 2.12, W 2.40. Integument crimson red, covered by short black hairs. There are four spots of white hairs. Two of them are in the anterior third of the cephalic part. The other two spots are smaller (about one-quarter of the anteriors) present just before PLE. Behind the area of the median eyes, there is a small bare area. Eye measurements: AME 0.11, ALE 0.09, PME 0.13, PLE 0.10, AM-AM 0.12, AL-AL 1.67, PM-PM 0.32, PL-PL 1.52, AM-AL 0.72, AM-PM 0.02. Thoracic part: L 1.12, W 2.25; posterior edge notched forwards. Lighter in colour than cephalic part, with sparse black hairs on both sides, mixed with white hairs near edges, which increase on both sides posteriorly. Fovea small. The area behind fovea is bare except of a few white hairs. Chelicerae: crimson red, covered by black hairs, longer anteriorly, and nearly bare in parts adjacent to labium and maxillae. Sternum L 1.87; anteriorly wide, posteriorly attenuated between coxae IV, with minute extensions among other coxae; reddish brown, covered by sparse black hairs. Labium L 0.67; Maxilla L 1.00; like sternum in colour. Pedipalps: crimson red, covered by black hairs, except the patella which is covered by white hairs. Palpal organ (Figs. 13, 24-26): terminal element of conductor is screw-shaped with two projections visible together ventrally (Fig. 26), and only one of them appears alone retrolaterally while the other appears prolaterally. Legs: crimson red, covered by black and white hairs. Coxae: lighter in colour, with sparse

white hairs at borders of trochanters. Leg I: femur black with white hairs near patella; patella 1/4 white, 3/4 black; tibia 2/3 black, 1/3 white; metatarsus 1/3 white, 2/3 black; tarsus 1/2 white, 1/2 black. Leg II: like leg I except: patella 3/4 white, 1/4 black; tibia 1/2 black, 1/2 white. Leg III: white except lateral sides of femur and tip of tarsus black. Leg IV: femur black with white hairs near patella; patella white; tibia 1/3 white, 2/3 white with black lateral sides; metatarsus and tarsus like leg III. Tarsi: tip thickened, laterally pressed; with weak scopula. Spination pattern: only on tibiae III & IV, metatarsi and tarsi I-IV. Legs I & II: metatarsus I v 0-0-2 p 0-0-1, II v 0-2-2 p 0-1-1-1 r 0-0-1; tarsus with a few ventral spines. Legs III & IV: tibia III v 0-0-2, IV v 0-0-2-3; metatarsi and tarsi with numerous ventral spines and rarely prolateral and retrolateral spines at distal end.

Table 4. Leg measurements of *Dorceus quadrispilotus* male.

Leg	I	II	III	IV
Femur	2.62	2.25	1.82	2.50
Patella	1.22	1.20	1.00	1.22
Tibia	1.45	1.25	1.00	1.85
Metatarsus	1.67	1.50	1.20	1.75
Tarsus	1.12	0.97	0.65	0.87
Total length	8.08	7.17	5.67	8.19

Abdomen: L 2.87; entirely covered by black hairs dorsally, except two white oblong spots anteriorly, separated by an area equal to size of spot. Posteromedially semi-circular procurved wide band which thickened at both ends forming two triangles, with tops facing each other. This band and triangles covered by white hairs. Also, there is a small spot of white hairs above spinnerets at the end of the abdomen. These white areas on black background form the picture of an "African mask" with two eyes, a mouth, and a white chin (El-Hennawy, 1998: Fig. 1). Ventrally covered by black hairs, except the bipartite cribellum and the large creamy white area above the book lungs. Spinnerets: anterior pair big and others comparatively very small.

Measurements of MNHN specimens: TL 6.12, 6.29, 8.50; cephalic area L 2.13, 2.30, 2.72, W 2.55, 2.64, 3.15; abdomen L 3.23, 3.49, 4.42.

Female: unknown.

Distribution: Egypt: Alexandria: Mariout (Letourneux) (Simon, 1908, 1910); near El-Hammam, west of Alexandria (El-Hennawy, 1998) (Fig. 31).

Habitat: Semi-arid region very near to the Mediterranean seacoast. Climate, in May, very humid in the early morning; cold before sunrise and moderately hot at noon; mean temperature 17.5-21.0°C; Rainfall 0.4-0.8 mm; evaporation 5.0-7.5 mm/day; and relative humidity 67.0-73.5% (Ali 1982). Ground of semi-stabilized sand, covered by low vegetation, mostly of annual herbs.

Dorceus trianguliceps Simon, 1910
(Figs. 8, 14, 27-29, 30-31. Table 5)

Dorceus trianguliceps Simon, 1910: 292-293.

Material examined: MNHN: *Dorceus trianguliceps*, tube no.23757 (AR5401) 1 ♂ from SE Tunisia "entre Gabès F.Tatahouine et la fre. Tripolitaine".

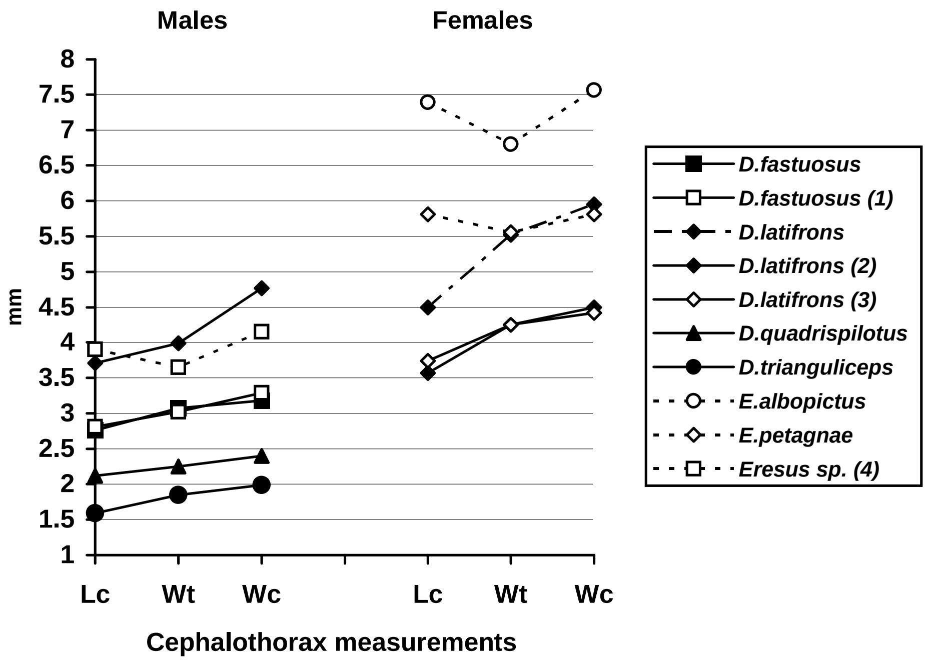


Figure 30. Comparison of cephalothorax measurements of *Dorceus* males and females, in addition to *Eresus* species. Lc, Wc = length and width of cephalic part, Wt = width of thoracic part. 1 = Type of *D. viberti*, 2 = formerly considered *D. eburneus*, 3 = formerly misidentified as *D. viberti*, 4 = formerly identified as *D. fastuosus*, OMNH.

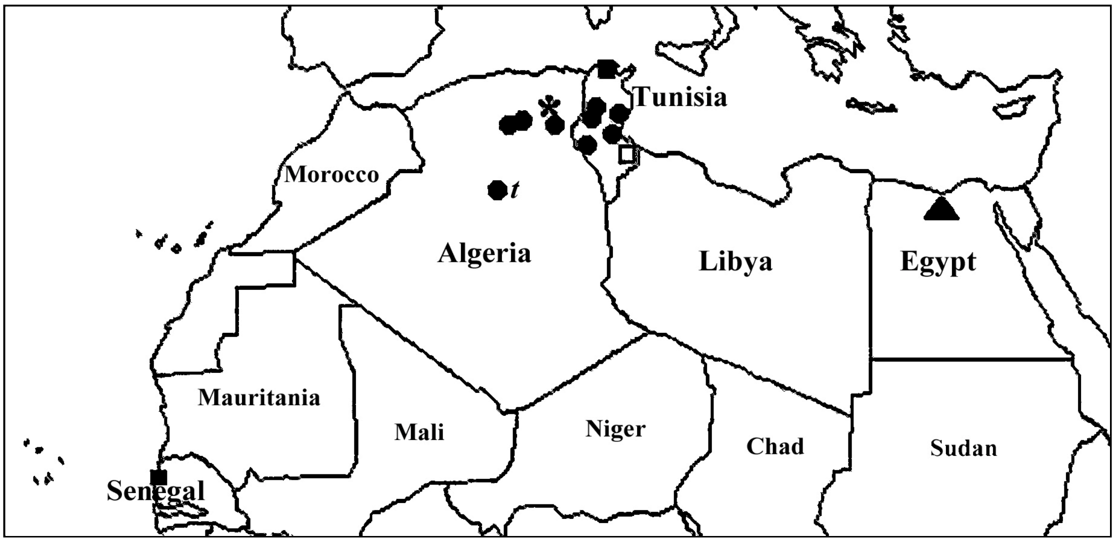


Figure 31. Map showing distribution of *Dorceus* species in North Africa and Senegal. *D.albolunulatus* (asterisk), *D.fastuosus* (black square), *D.latifrons* (black circle) [*t* = type locality], *D.quadrispilotus* (black triangle), *D.trianguliceps* (white square).

Description: Male (Holotype): TL 5. Cephalothorax: L 2.12. Integument : yellow. Cephalic part: L 1.59, W 1.99; with triangle-shaped area, its base between PLE and its apex just behind MOQ; as well as anterior and lateral edges, covered by brown hairs; remaining area, including the MOQ and two converted triangles among the MOQ, ALE, and PLE covered by creamy white hairs. Eye measurements: AME 0.07, ALE 0.07,

PME 0.10, PLE 0.07, AM-AM 0.10, AL-AL 1.46, PM-PM 0.28, PL-PL 1.39, AM-AL 0.61, AM-PM 0.05. Thoracic part: L 0.53, W 1.85; covered by creamy white hairs. Fovea small. Chelicerae: covered by dense brown hairs anteriorly. Sternum L 1.46; posteriorly attenuated between coxae IV, with minute extensions among other coxae. Labium L 0.48, Maxilla L 0.68; covered by sparse brown hairs (darker than coxae). Pedipalps: covered by long brown hairs. Palpal organ (Figs. 14, 27-29): terminal element of conductor L-shaped retrolaterally (Fig. 28). Legs: femora, tibiae (except the distal third), metatarsi and tarsi (except the apical part) covered by brown hairs; excepted areas covered by creamy white hairs. Tarsi: tip thickened, laterally pressed; with weak scopula. Spination pattern: only ventral on tibiae, metatarsi and tarsi I-IV. Leg I: tibia 0-0-2. Leg II: tibia 0-0-2; metatarsus 0-0-2. Leg III: tibia 0-0-2; metatarsus 0-1-4; tarsus 0-0(2)-4. Leg IV: tibia 0-0-1,2; metatarsus 1,1-2,2-1,5; tarsus 0-1-5.

Table 5. Leg measurements of *Dorceus trianguliceps* male.

Leg	I	II	III	IV
Femur	1.63	1.46	1.36	1.70
Patella	1.02	0.85	0.68	0.95
Tibia	1.02	0.92	0.68	1.19
Metatarsus	1.36	1.02	0.68	1.05
Tarsus	0.75	0.85	0.41	0.78
Total length	5.78	5.10	3.81	5.67

Abdomen: L 3.34; covered dorsally by brown hairs, except two areas on both sides of the median third of it which are covered by white hairs; the two areas are semicircular-shaped, near to each other posteriorly, but not connected; each of them has two internal protrusions (Fig. 8), and something similar to the abdominal pattern of *D. quadrispilotus*; with an indefinite whitish area in front of the spinnerets; ventral side covered by brown hairs.

Female: unknown.

Distribution: Tunisia: region between Gabès 33°53'N 10°04'E, on seacoast, Foum Tatahouine 32°58'N 10°26'E, about 83 km from seacoast, and the Libyan boundaries (Vibert) (Simon, 1910) (Fig. 31).

Other Species

Eresus albopictus Simon, 1873

Eresus albopictus Simon, 1873b: 352-353, pl.10, fig.12; 1910: 295-296.
Eresus lucasi Simon, 1873b: 353-355, pl.10, figs.8,9; 1892: 251. (synonymized by Roewer, 1954)
Dorceus albopictus Lehtinen, 1967: 231 (transferred from *Eresus*).

Material examined: MNHN: 2 tubes, from Morocco: 2♀ from: Agadir 30°27'N 09°36'W on Atlantic ocean coast (L.Berland, IV-1939) (AR5387); 2♀ (dry) from: Goulimine 29°00'N 10°05'W about 35 km from Atlantic ocean coast (L.Berland, V-1939) (AR5388). [No material of *Eresus lucasi*]

The genitalia of this species were examined and compared with the three female specimens of *Dorceus latifrons* to find that they are completely different. This species does not belong to genus *Dorceus*. The ratio between length and width of cephalic part and width of thoracic part (Fig. 30) elucidates this. It is obvious in this figure that *E. albopictus* is different from *Dorceus* females and similar to *Eresus* specimens (Two females of *E. petagnae* (Audouin, 1825) from Alexandria, Egypt, B.507 t.9 OMNH,

were compared with.). It was transferred to genus *Dorceus* by Lehtinen (1967). It has to be restored to genus *Eresus* again.

Distribution: Algeria: El-Asnam (Orléansville) 36°04'N 01°19'E, about 42 km from seacoast, Daya? (L.Bedel); Wahran (Oran) 35°42'N 00°38'W, on seacoast; Maghnia (Marnia) 34°51'N 01°43'W, about 34 km from seacoast; near Oran [2 ♂, 1 ♀], 1 ♂ from small locality called Lalla-Maghrnia (M. H.Lucas 1850). **Morocco**: Essaouira (Mogador) 31°40'N 09°45'W, on Atlantic ocean coast (de la Escalera), Melilla 35°13'N 02°57'W, on seacoast (Arias). **Italy**: Sicily: near Palermo 38°08'N 13°25'E, on seacoast (M.le professeur Waga) [That record was doubted by Simon (1910) although he accepted it before (1873b), but it may be true because Sicily is very near to the African Mediterranean coast. Therefore, it maybe possible to find this species there.]

Seothyra griffinae Dippenaar-Schoeman, 1990

The "rather deviating undescribed species from Central Africa" mentioned by Lehtinen (1967) from the Museum of Geneva has been examined. It is not a *Dorceus* species but a *Seothyra*, its sister genus. It could be identified as *Seothyra griffinae* according to the revision of this genus by Dippenaar-Schoeman (1990) who firstly described a male of this species from north Namibia. The locality of the Geneva specimen is Cului, in south of Angola, near the type locality.

Natural History

In 1967, Lehtinen stated that: "Nothing is known about the habits of *Dorceus*", except that it was expected to be "terricole" or subterranean (Simon, 1892; Lehtinen 1967) due to the morphological resemblance between it and *Seothyra*. Unfortunately, the nests of *Dorceus* species have not been discovered in nature, in contrast to *Seothyra* which has well-described subterranean nests (Dippenaar-Schoeman, 1990).

The male specimen of *D. quadrispilotus*, which was described by El-Hennawy (1998), was found at noon, running on the hot ground in a way similar to ant's movement. This behaviour resembles that of *Seothyra* (Dippenaar-Schoeman, 1990). That specimen was kept alive for a few days in a transparent plastic bottle filled partly with sand. After the first night, it hid under a tent of sand and silk threads, shaped like a dome with a few parallel threads spread from it for a few millimetres on the surface of sand. When the tent was turned over, the spider was found hanging upside down inside. There was no burrow like that of *Seothyra*. But it may construct a burrow in nature ?

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A list of Egyptian spiders (revised in 2002)

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This list includes names of spider species, recorded from Egypt, with their distribution localities. It is preceded by a table which includes names of recorded spider families followed by number of recorded genera and species (within parentheses). A few species maybe considered *nomina dubia* and some records are not certain. The verification and corrigenda will be available in a detailed work revising different spider families of Egypt. This work is a trial to bring the author's "Annotated checklist of Egyptian spider species" of 1990 to be up to date.
[Abbreviations: ? = unknown locality, * = Endemic species, Prot. = Protectorate]

Order Araneida (Araneae, Aranei)
Suborder Opisthothelae
Infraorder Mygalomorphae

Nemesiidae	1 (1)	Theraphosidae	1 (3)

Infraorder Araneomorphae

Agelenidae	4 (7)	Liocranidae	1 (2)	Salticidae	35 (68)
Araneidae	15 (24)	Lycosidae	19 (42)	Scytodidae	1 (5)
Cithaeronidae	1 (1)	Mimetidae	1 (1)	Segestriidae	2 (2)
Clubionidae	1 (1)	Miturgidae	2 (9)	Selenopidae	1 (1)
Corinnidae	1 (1)	Mysmenidae	1 (1)	Sicariidae	1 (1)
Ctenidae	1 (1)	Oecobiidae	2 (6)	Sparassidae	6 (12)
Dictynidae	5 (6)	Oonopidae	4 (5)	Tetragnathidae	2 (5)
Dysderidae	1 (7)	Oxyopidae	2 (6)	Theridiidae	10 (25)
Eresidae	3 (9)	Palpimanidae	1 (3)	Thomisidae	10 (24)
Filistatidae	2 (2)	Philodromidae	3 (19)	Titanoecidae	2 (2)
Gnaphosidae	17 (51)	Pholcidae	5 (5)	Uloboridae	1 (2)
Hersiliidae	2 (2)	Pisauridae	4 (4)	Zodariidae	5 (8)
Linyphiidae	8 (8)	Prodidomidae	3 (3)		

TOTAL : 40 Families, 187 genera, 385 species

Infraorder Mygalomorphae

Family Nemesiidae

Nemesia cellicola Savigny, 1825 --- Alexandria

Family Theraphosidae

Chaetopelma aegyptiacum Ausserer, 1871 --- Alexandria, El-Fayum, Upper Egypt
Chaetopelma olivaceum (C.L.Koch, 1842) --- Cairo
Chaetopelma shabati Hassan, 1950 --- Cairo, El-Fayum *

Infraorder Araneomorphae

Family Agelenidae

Benoitia lepida (O.P.-Cambridge, 1876) --- El-Omayed Prot., El-Zaranik Prot. (west of El-Arish), New Valley, Siwa Oases, southern Sinai, Upper Egypt, Wadi El-Rayian, Wadi Natron
Benoitia timida (Savigny, 1825) --- Rosetta
Lycosoides coarctata (Dufour, 1831) --- Alexandria, Nile Barrage
Tegenaria domestica (Clerck, 1757) --- Rosetta
Tegenaria pagana C.L.Koch, 1841 --- Cairo
Tegenaria parietina (Fourcroy, 1785) --- Alexandria
Textrix caudata L.Koch, 1872 --- ?

Family Araneidae

Agalenatea redii (Scopoli, 1763) --- southern Sinai
Araneus circe (Savigny, 1825) --- Alexandria
Araneus flavissimus Linnaeus, 1758 --- ? *
Argiope bruennichi (Scopoli, 1772) --- ?
Argiope lobata (Pallas, 1772) --- Alexandria, Cairo, El-Burullus Prot., El-Zaranik Prot. (west of El-Arish), Nabq Prot. and Ras Mohammed Prot. (S.Sinai), St.Catherine, Wadi El-Rayian, El-Shalateen and Wadi De'eeb (S.E.Egypt)
Argiope obscuripes Strand, 1906 --- Wadi Natron *
Argiope sector (Forskål, 1775) --- Nubia, Port Said, Siwa Oasis, Upper Egypt
Argiope trifasciata (Forskål, 1775) --- Alexandria, Cairo, El-Burullus Prot., El-Tahrir Province, Siwa Oasis, Wadi El-Rayian, Wadi Natron
Cyclosa insulana (Costa, 1834) --- Siwa Oasis, Wadi Natron
Cyrtophora citricola (Forskål, 1775) --- Abu Galoum Prot. and Ras Mohammed Prot. (S.Sinai), Cairo, Siwa Oasis, Wadi El-Rayian, Wadi Natron
Gasteracantha sanguinolenta C.L.Koch, 1845 --- ?
Gasteracantha sanguinolenta rueppelli (Strand, 1915) --- ? *
Gea nilotica Simon, 1906 --- ? *
Gibbaranea bituberculata (Walckenaer, 1802) --- Alexandria, Cairo
Hypsosinga albovittata (Westring, 1851) --- Alexandria
Larinia acuticauda Simon, 1906 --- Luxor, Siwa Oasis
Larinia chloris (Savigny, 1825) --- Siwa Oasis, Suez, Upper Egypt
Larinioides cornutus (Clerck,1757) --- Rosetta
Larinioides suspicax (O.P.-Cambridge, 1876) --- Alexandria, Damietta, El-Fayum, Rosetta, Siwa Oasis, Wadi Natron
Neoscona perplicata (O.P.-Cambridge, 1872) --- Alexandria
Neoscona subfusca (C.L.Koch, 1837) --- Siwa Oasis
Nuctenea umbratica (Clerck, 1757) --- Damietta
Singa lucina (Savigny, 1825) --- Alexandria, Rosetta
Singa semiatra L.Koch, 1867 --- ?
Siwa atomaria (O.P.-Cambridge, 1876) --- Assuan, Cairo, Siwa Oasis, Upper Egypt

Family Cithaeronidae
Cithaeron praedonius O.P.-Cambridge, 1872 --- Alexandria

Family Clubionidae
Clubiona listeri Audouin, 1825 --- ? *

Family Corinnidae
Castianeira antinorii (Pavesi, 1880) --- Cairo (Giza), Siwa Oasis

Family Ctenidae
Anahita pallida (L.Koch, 1875) --- ?

Family Dictynidae
Archaeodictyna anguiniceps (Simon, 1899) --- New Valley, Siwa Oasis, Wadi Natron
Archaeodictyna condocta (O.P.-Cambridge, 1876) --- Alexandria, Cairo, Lower Egypt, Suez
Devade indistincta (O.P.-Cambridge, 1872) --- Mariout, Siwa Oasis, Suez
Dictyna innocens O.P.-Cambridge, 1872 --- Cairo
Lathys humilis (Blackwall, 1855)
Lathys humilis meridionalis (Simon, 1874) --- Alexandria
Nigma conducens O.P.-Cambridge, 1876 --- Cairo, Lower Egypt, Elephantine and Philoe island (Assuan), Wadi-Halfa

Family Dysderidae
Dysdera crocota C.L.Koch, 1839 --- Alexandria
Dysdera erythrina (Walckenaer, 1802) --- ?
Dysdera lata Wider, 1834 --- Alexandria, Cairo
Dysdera lubrica Simon, 1907 --- Alexandria, Cairo *
Dysdera pharaonis Simon, 1907 --- Alexandria, Mariout *
Dysdera subnubila Simon, 1907 --- Alexandria, Cairo *
Dysdera westringii O.P.-Cambridge, 1872 --- Alexandria

Family Eresidae
Dorceus quadrispilotus Simon, 1908 --- Alexandria, Mariout, west of El-Hammam *
Eresus petagnae Audouin, 1825 --- Alexandria
Eresus pharaonis Walckenaer, 1837 --- ? *
Eresus pulchellus Lucas, 1864 --- Nubia *
Eresus semicanus Simon, 1908 --- Alexandria, Mariout, Suez
Eresus walckenaeri Brullé, 1832 --- ?
Stegodyphus dufouri (Audouin, 1825) --- Abu Galoum Prot. (S.Sinai), Alexandria, Assiut, Assuan, Beni Suef, Cairo, Damietta, El-Baharia Oases, El-Fayum, El-Menoufeia, Giza, Ismailia, Kena, Luxor, Nile Barrage, Port Said, Sinai, Siwa Oasis, Sohag, Suez, Wadi El-Raiyan, Wadi Halfa, Wadi Natron
Stegodyphus lineatus (Latreille, 1817) --- Alexandria, Cairo, Damietta, El-Burullus Prot., El-Shalateen and Bir El-Gahliya (S.E.Egypt), El-Zaranik Prot. (west of El-Arish), Ras El-Barr, southern Sinai, Siwa Oasis, Suez
Stegodyphus manicatus Simon, 1876 --- Cairo

Family Filistatidae
Filistata insidiatrix (Forskål, 1775) --- Alexandria, Cairo, Lower Egypt, Siwa Oasis
Sahastata nigra (Simon, 1897) --- Cairo, Luxor, Suez

Family Gnaphosidae
Aphantaulax albini (Audouin, 1825) --- ?
Aphantaulax cinctus (L.Koch, 1866) --- Alexandria

Berlandina plumalis (O.P.-Cambridge, 1872) --- Alexandria, Cairo
Berlandina venatrix (O.P.-Cambridge, 1874) --- Alexandria, Assuan, Cairo, Luxor, Sinai, Siwa Oasis, Wadi Halfa
Drassodes aegyptius (O.P.-Cambridge, 1874) --- Alexandria
Drassodes alexandrinus (O.P.-Cambridge, 1874) --- Alexandria *
Drassodes citipes Simon, 1893 --- ? *
Drassodes denotatus (O.P.-Cambridge, 1874) --- Cairo *
Drassodes ensiger (O.P.-Cambridge, 1874) --- ?
Drassodes infumatus (O.P.-Cambridge, 1872) --- Cairo
Drassodes pseudomorosus Strand, 1915 --- ?
Leptodrassus pupa Dalmas, 1919 --- Suez *
Megamyrmaekion caudatum Reuss, 1834 --- ? *
Megamyrmaekion vulpinum (O.P.-Cambridge, 1874) --- Assuan, Cairo
Minosia pharao Dalmas, 1920 --- Alexandria, Cairo *
Minosia simeonica Levy, 1995 --- southern Sinai
Minosiella mediocris Dalmas, 1920 --- Cairo, El-Fayum, Siwa Oasis, Suez
Minosiella pharia Dalmas, 1920 --- Cairo
Nomisia aussereri (L.Koch, 1872) --- Alexandria, Cairo
Nomisia recepta (Pavesi, 1880) --- ?
Odontodrassus mundulus (O.P.-Cambridge, 1872) --- Cairo, southern Sinai
Poecilochroa antineae Fage, 1929 --- ? *
Poecilochroa monodi Fage, 1929 --- Cairo, El-Fayum
Poecilochroa pugnax (O.P.-Cambridge, 1874) --- Alexandria, Cairo, Ismailia, Siwa Oasis, Suez
Poecilochroa senilis (O.P.-Cambridge, 1872) --- Alexandria
Pterotricha conspersa (O.P.-Cambridge, 1872) --- Cairo, Giza, Siwa Oasis, southern Sinai
Pterotricha dalmasi Fage, 1929 --- Siwa Oasis, southern Sinai
Pterotricha lentiginosa (C.L.Koch, 1837) --- ?
Pterotricha lesserti Dalmas, 1920 --- El-Zaranik Prot. (west of El-Arish), Ras Sedr
Pterotricha linnaei (Audouin, 1825) --- ?
Pterotricha procera (O.P.-Cambridge, 1874) --- Alexandria, Cairo
Pterotricha schaefferi (Audouin, 1825) --- Alexandria, Assuan, Cairo, Suez, Wadi El-Rayian, Wadi Halfa
Setaphis mollis (O.P.-Cambridge, 1874) --- Alexandria
Setaphis subtilis (Simon, 1897) --- Cairo, Ismailia, Nile Delta, Ras El-Barr, Shebin El-Kom, Sohag, southern Sinai, Wadi El-Rayian
Synaphosus gracillimus (O.P.-Cambridge, 1872) --- En Higiya (NE of Abu Zneima) & Mount Serbal (St.Catherine) (Southern Sinai), Wadi Degla (El-Maadi, Cairo), Wadi Rishrash (Eastern desert)
Synaphosus intricatus (Denis, 1947) --- Siwa Oasis
Synaphosus minimus (Caporiacco, 1936) --- Dahab & Wadi Yah'med (southern Sinai), El-Auenat (SW of the Western Desert)
Synaphosus syntheticus (Chamberlin, 1924) --- Cairo (Zenhum & Helwan), Sohag
Talanites ornatus (O.P.-Cambridge, 1874) --- Alexandria *
Trachyzelotes jaxartensis (Kroneberg, 1875) --- Assiut, Luxor
Trachyzelotes lyonneti (Audouin, 1825) --- ?
Urozelotes rusticus (L.Koch, 1872) --- Marsa Matruh, Siwa Oasis
Zelotes curinus (O.P.-Cambridge, 1874) --- Alexandria *
Zelotes inauratus (O.P.-Cambridge, 1872) --- Alexandria, Lower Egypt

Zelotes laetus (O.P.-Cambridge, 1872) --- Cairo
Zelotes listeri (Audouin, 1825) --- southern Sinai *
Zelotes nilicola (O.P.-Cambridge, 1874) --- Alexandria, Nile Delta, El-Tahrir Province (west of the Delta)
Zelotes picinus (O.P.-Cambridge, 1872) --- Alexandria
Zelotes simplex Denis, 1936 --- Siwa Oasis
Zelotes tenuis (L.Koch, 1866) --- Alexandria
Zelotes tristiculus (O.P.-Cambridge, 1874) --- Alexandria *

Family Hersiliidae
Hersilia caudata Savigny, 1825 --- Cairo to Assuan
Hersiliola lucasi (O.P.-Cambridge, 1876) --- Alexandria

Family Linyphiidae
Bathyphantes extricatus (O.P.-Cambridge, 1876) --- Alexandria, Cairo *
Brachycerasphora parvicornis (Simon, 1884) --- Alexandria *
Erigone dentipalpis (Wider, 1834) --- El-Aasher-Min-Ramadan City (65 km east of Cairo), Nile Delta
Gnathonarium dentatum (Wider, 1834) --- Nile Delta
Gnathonarium dentatum orientale (O.P.-Cambridge, 1872) --- ?
Meioneta rurestris (C.L.Koch, 1836) --- Alexandria
Microctenonyx alexandrinus (O.P.-Cambridge, 1872) --- Alexandria
Prinerigone vagans (Savigny, 1825) --- Alexandria, Cairo, New Valley, Nile Delta, Wadi Natron
Silometopus curtus (Simon, 1881) --- ?

Family Liocranidae
Mesiotelus alexandrinus (Simon, 1880) --- Edko (near Alexandria) *
Mesiotelus tenuissimus (L.Koch, 1866) --- Alexandria, Ismailia, southern Sinai

Family Lycosidae
Allocosa deserticola (Simon, 1898) --- Saqqarah (near Giza) *
Allocosa sennaris Roewer, 1959 --- ? *
Allocosa tarentulina (Savigny, 1825) --- Alexandria
Allocosa tremens (O.P.-Cambridge, 1876) --- Alexandria
Alopecosella pelusiaca (Savigny, 1825) --- El-Manzalah
Arctosa cinerea (Fabricius, 1776) --- Siwa Oasis, southern Sinai, Upper Egypt, Wadi Natron
Arctosa depuncta (O.P.-Cambridge, 1876) --- Alexandria
Arctosa leopardus (Sundevall, 1832) --- Alexandria
Arctosa quadripunctata (Lucas, 1846) --- Siwa Oasis
Aulonia werneri Roewer, 1960 --- ? *
Crocodilosa virulenta (O.P.-Cambridge, 1876) --- Cairo *
Evippa arenaria (Savigny, 1825) --- Rosetta
Evippa praelongipes (O.P.-Cambridge, 1870) --- southern Sinai
Evippa ungulata (O.P.-Cambridge, 1876) --- Assuan, Luxor, Siwa Oasis, Upper Egypt, Wadi El-Rayian
Geolycosa urbana (O.P.-Cambridge, 1876) --- Alexandria, Siwa Oasis
Hippasa innesi Simon, 1889 --- Cairo, Suez *
Hippasa partita (O.P.-Cambridge, 1876) --- Alexandria
Hyaenosa effera (O.P.-Cambridge, 1872) --- Alexandria, Cairo
Hogna alexandria Roewer, 1960 --- ? *
Hogna ferox (Lucas, 1838) --- Nile Delta, Siwa Oasis, Wadi Natron

Hogna peregrina (Savigny, 1825) --- Rosetta *
Lycosa cingara (C.L.Koch, 1848) --- ? *
Lycosa cretacea Simon, 1898 --- Saqqarah (near Giza)
Lycosa nilotica Savigny, 1825 --- Alexandria, Assuan, Cairo *
Lycosa radiata Latreille, 1819 --- Cairo
Lycosa sinaia (Roewer, 1959) --- Sinai *
Lycosa tarentula (Rossi, 1790) --- southern Sinai
Lycosa truculenta (O.P.-Cambridge, 1876) --- Alexandria *
Megarctosa argentata (Denis, 1947) --- Siwa Oasis *
Ocyale atalanta Savigny, 1825 --- Wadi Natron
Ocyale pelliona (Savigny, 1825) --- Rosetta
Orinocosa priesneri Roewer, 1959 --- ? *
Orthocosa ambigua (Denis, 1947) --- Siwa Oasis *
Pardosa iniqua (O.P.-Cambridge, 1876) --- Alexandria *
Pardosa injucunda (O.P.-Cambridge, 1876) --- Alexandria, Cairo, Siwa Oasis
Pardosa inopina (O.P.-Cambridge, 1876) --- Alexandria, Wadi Natron
Pardosa inquieta (O.P.-Cambridge, 1876) --- Alexandria *
Pardosa observans (O.P.-Cambridge, 1876) --- Alexandria *
Pardosa serena (L.Koch, 1875) --- Cairo *
Pirata proxima O.P.-Cambridge, 1876 --- Alexandria *
Trochosa annulipes L.Koch, 1875 --- Cairo
Wadicosa venatrix (Lucas, 1846) --- Alexandria, Assuan, Cairo, Siwa Oasis, Suez, Wadi Natron

Family Mimetidae
Mimetus monticola (Blackwall, 1870) --- Cairo

Family Miturgidae
Cheiracanthium annulipes O.P.-Cambridge, 1872 --- Cairo, Philoe island (Assuan), Wadi Natron
Cheiracanthium canariense Wunderlich, 1987 --- El-Zaranik Prot. (west of El-Arish)
Cheiracanthium equestre O.P.-Cambridge, 1874 --- Cairo, Siwa Oasis
Cheiracanthium isiacum O.P.-Cambridge, 1874 --- Cairo, Nile Delta, Siwa Oasis, Sohag, Wadi Natron
Cheiracanthium jovium Denis, 1947 --- Siwa Oasis
Cheiracanthium mildei L.Koch, 1864 --- southern Sinai
Cheiracanthium pelasgicum (C.L.Koch, 1837) --- Beni Suef, Qalyubia, Rafah
Cheiracanthium siwi El-Hennawy, 2001 --- Siwa Oasis *
Cheiramiona dubia (O.P.-Cambridge, 1874) --- Alexandria *

Family Mysmenidae
Synaphris letourneuxi (Simon, 1884) --- ? *

Family Oecobiidae
Oecobius maculatus Simon, 1870 --- Giza
Oecobius navus Blackwall, 1859 --- Alexandria, Ismailia, Upper Egypt
Oecobius putus O.P.-Cambridge, 1876 --- Cairo, Giza, Ismailia, Upper Egypt
Oecobius templi O.P.-Cambridge, 1876 --- Cairo, Upper Egypt
Uroctea durandi (Latreille, 1809) --- ?
Uroctea limbata (C.L.Koch, 1843) --- Alexandria

Family Oonopidae
Dysderina scutata (O.P.-Cambridge, 1876) --- Alexandria, Cairo *

Gamasomorpha arabica Simon, 1893 --- Ain-Musa (near Suez) *
Gamasomorpha margaritae Denis, 1947 --- Siwa Oasis *
Opopaea punctata (O.P.-Cambridge, 1872) --- Ain-Musa (near Suez), Alexandria
Sulsula paupera (O.P.-Cambridge, 1876) --- Alexandria

Family Oxyopidae
Oxyopes bilineatus O.P.-Cambridge, 1876 --- Cairo *
Oxyopes heterophthalmus (Latreille, 1804) --- Alexandria, Cairo, Sinai
Oxyopes lineatus Latreille, 1806 --- ?
Peucetia arabica Simon, 1882 --- Cairo, Siwa Oasis, southern Sinai, Suez
Peucetia virescens (O.P.-Cambridge, 1872) --- Dakhla Oases
Peucetia viridis (Blackwall, 1858) --- Dahshur (Giza), Sinai

Family Palpimanidae
Palpimanus aegyptiacus Kulczyński, 1909 --- ? *
Palpimanus gibbulus Dufour, 1820 --- Alexandria, Cairo to Luxor, Nubia
Palpimanus uncatus Kulczyński, 1909 --- ? *

Family Philodromidae
Philodromus bigibbus (O.P.-Cambridge, 1876) --- Alexandria, Assuan
Philodromus cinereus O.P.-Cambridge, 1876 --- Cairo *
Philodromus clerckii Audouin, 1825 --- ? *
Philodromus denisi Levy, 1977 --- Siwa Oasis *
Philodromus glaucinus Simon, 1870 --- Ismailia, Siwa Oasis, Upper Egypt
Philodromus lepidus Blackwall, 1870 --- Assuan, Cairo, Wadi Natron
Philodromus lugens (O.P.-Cambridge, 1876) --- Alexandria *
Philodromus omer-cooperi Denis, 1947 --- Siwa Oasis *
Philodromus sinaiticus Levy, 1977 --- Nabq Prot. (S.Sinai) *
Philodromus venustus O.P.-Cambridge, 1876 --- Cairo to Manfalut *
Thanatus albescens O.P.-Cambridge, 1885 --- Sinai
Thanatus albini (Audouin, 1825) --- Cairo, El-Tahrir Province, New Valley, Nile Delta, Siwa Oasis, Sohag
Thanatus fabricii (Audouin, 1825) --- Alexandria, Siwa Oasis
Thanatus flavescens O.P.-Cambridge, 1876 --- Cairo *
Thanatus flavus O.P.-Cambridge, 1876 --- Alexandria *
Thanatus formicinus (Clerck, 1757) --- ?
Thanatus fornicatus Simon, 1897 --- Sinai
Thanatus lesserti (Roewer, 1951) --- Cairo
Tibellus vossioni Simon, 1884 --- Siwa Oasis

Family Pholcidae
Artema atlanta Walckenaer, 1837 --- Cairo, Siwa Oasis, Wadi Natron
Crossopriza semicaudata (O.P.-Cambridge, 1876) --- Cairo to Luxor
Holocnemus pluchei (Scopoli, 1763) --- Alexandria, Cairo, Nabq Prot. (S.Sinai), Wadi Natron
Micropholcus fauroti (Simon, 1887) --- ?
Pholcus phalangioides (Fuesslin, 1775) --- Alexandria

Family Pisauridae
Dolomedes hyppomene Savigny, 1825 --- Damietta *
Nilus curtus O.P.-Cambridge, 1876 --- Alexandria *
Pisaura mirabilis (Clerck, 1757) --- ?
Rothus atlanticus Simon, 1898 --- Siwa Oasis

Family Prodidomidae
Prodidomus amaranthinus (Lucas, 1846) --- Alexandria, Cairo
Zimirina vastitatis Cooke, 1964 --- El-Sallum
Zimiris sp. --- Heliopolis-Cairo (inside a house) [Unpublished record]

Family Salticidae
Aelurillus catherinae Prószyński, 2000 --- St.Catherine *
Aelurillus conveniens (O.P.-Cambridge, 1872) --- Siwa Oasis
Aelurillus dorthesi (Audouin, 1825) --- Cairo, Wadi Natron *
Aelurillus mallezi Denis, 1947 --- Siwa Oasis *
Aelurillus monardi (Lucas, 1846) --- Cairo
Aelurillus ogieri (Simon, 1868) --- Lower Egypt
Aelurillus sinaicus Prószyński, 2000 --- N.Mid Sinai
Ballus piger O.P.-Cambridge, 1876 --- Upper Egypt *
Bianor albobimaculatus (Lucas, 1846) --- Alexandria, Cairo, Siwa Oasis, Suez
Carrhotus occidentalis (Denis, 1947) --- Siwa Oasis *
Chalcoscirtus catherinae Prószyński, 2000 --- St.Catherine, near Taba
Cosmophasis nigrocyanea (Simon, 1885) --- Siwa Oasis
Euophrys catherinae Prószyński, 2000 --- St.Catherine, southern Sinai *
Euophrys granulata Denis, 1947 --- Siwa Oasis *
Festucula vermiformis Simon, 1901 --- Alexandria, Suez *
Hasarius adansoni (Audouin, 1825) --- Alexandria, Cairo, Ras El-Barr
Heliophanillus fulgens (O.P.-Cambridge, 1872) --- Alexandria, Cairo, Siwa Oasis, Upper Egypt
Heliophanillus lucipeta (Simon, 1890) --- Alexandria, Suez
Heliophanus cupreus (Walckenaer, 1802) --- ?
Heliophanus decoratus L.Koch, 1875 --- Alexandria, Cairo, Siwa Oasis, Suez, Wadi Natron
Heliophanus edentulus Simon, 1871 --- Alexandria
Heliophanus glaucus Bösenberg & Lenz, 1894 --- Alexandria, Siwa Oasis
Hyllus plexippoides Simon, 1906 --- ?
Langona alfensis Hęciak & Prószyński, 1983 --- Wadi Halfa
Langona mendax (O.P.-Cambridge, 1876) --- Cairo
Langona redii (Audouin, 1825) --- Alexandria
Mendoza canestrinii (Ninni, 1868) --- Alexandria
Menemerus animatus O.P.-Cambridge, 1876 --- Alexandria, Cairo, El-Omayed Prot., El-Zaranik Prot. (west of El-Arish), Ras El-Barr, Siwa Oasis, Upper Egypt, Wadi Natron
Menemerus gesneri (Audouin, 1825) --- ?
Menemerus heydeni Simon, 1868 --- Cairo, Upper Egypt
Menemerus hunteri (Audouin, 1825) --- ?
Menemerus illigeri (Audouin, 1825) --- Cairo
Menemerus semilimbatus (Hahn, 1829) --- Cairo
Menemerus soldani (Audouin, 1825) --- Alexandria, Siwa Oasis
Modunda staintoni (O.P.-Cambridge, 1872) --- Upper Egypt, Suez
Mogrus bonneti (Audouin, 1825) --- Alexandria, Siwa Oasis, Upper Egypt, Wadi El-Rayian, Wadi Natron
Mogrus canescens (C.L.Koch, 1846) --- ?
Mogrus fulvovittatus Simon, 1882 --- Ras El-Barr
Mogrus sinaicus Prószyński, 2000 --- St.Catherine
Myrmarachne tristis (Simon, 1882) --- Nabq Prot. (S.Sinai)

Natta horizontalis Karsch, 1879 --- ?
Neaetha aegyptiaca Denis, 1947 --- Siwa Oasis *
Neaetha cerussata (Simon, 1868) --- ?
Neaetha oculata (O.P.-Cambridge, 1876) --- Upper Egypt
Pachypoessa plebeja (L.Koch, 1875) --- Cairo
Paraneaetha diversa Denis, 1947 --- Siwa Oasis *
Pellenes frischi (Audouin, 1825) --- ? *
Philaeus chrysops (Poda, 1761) --- southern Sinai
Phlegra flavipes Denis, 1947 --- Siwa Oasis *
Phlegra memorialis (O.P.-Cambridge, 1876) --- Siwa Oasis, Upper Egypt *
Phlegra proxima Denis, 1947 --- Siwa Oasis *
Plexippoides flavescens (O.P.-Cambridge, 1872) --- St.Catherine
Plexippus paykulli (Audouin, 1825) --- Abu Galoum Prot. (S.Sinai), Alexandria, Cairo, El-Shalateen and Bir El-Gahliya (S.E.Egypt), El-Zaranik Prot. (west of El-Arish), southern Sinai
Pseudicius spiniger (O.P.-Cambridge, 1872) --- Assuan, Cairo, Upper Egypt
Pseudicius tamaricis Simon, 1885 --- Siwa Oasis, Wadi Natron
Rafalus christophori Prószyński, 1999 --- St.Catherine
Rafalus feliksi Prószyński, 1999 --- N.W.Wadi Esla (S.Sinai) *
Salticus druryi Audouin, 1825 --- ?
Salticus mendicus O.P.-Cambridge, 1876 --- Alexandria to Assuan
Salticus mouffeti Audouin, 1825 --- Alexandria
Salticus paludivagus Lucas, 1864 --- Alexandria
Salticus propinquus Lucas, 1846 --- Alexandria, Kafr El-Sheikh
Stenaelurillus werneri Simon, 1906 --- ?
Synageles dalmaticus (Keyserling, 1863) --- Alexandria, Cairo
Synageles repudiatus (O.P.-Cambridge, 1876) --- Alexandria, Siwa Oasis *
Thyene imperialis (Rossi, 1846) --- Assuan, Cairo, El-Tahrir Province, New Valley, Sharm El-Sheikh, Siwa Oasis, Upper Egypt
Thyenula ammonis Denis, 1947 --- Siwa Oasis *
Yllenus saliens O.P.-Cambridge, 1876 --- Alexandria, Cairo, Oueinat, Suez, Upper Egypt

Family Scytodidae
Scytodes bertheloti Lucas, 1838 --- Wadi Natron
Scytodes immaculata L.Koch, 1875 --- Alexandria, Cairo, El-Fayum,
Upper Egypt, Wadi Halfa *
Scytodes obelisci Denis, 1947 --- Luxor *
Scytodes thoracica (Latreille, 1802) --- Cairo, Siwa Oasis
Scytodes velutina Heineken & Lowe, 1836 --- Cairo, Siwa Oasis, Wadi Natron

Family Segestriidae
Ariadna insidiatrix Savigny, 1825 --- Alexandria, Cairo
Segestria florentina (Rossi, 1790) --- Alexandria, Lower Egypt, S.W.Sinai

Family Selenopidae
Selenops radiatus Latreille, 1819 --- Wadi Natron, Nile Valley

Family Sicariidae
Loxosceles rufescens (Dufour, 1820) --- Alexandria, Cairo, Siwa Oasis

Family Sparassidae
Cebrennus aethiopicus Simon, 1880 --- Nubia
Cebrennus castaneitarsis Simon, 1880 --- Sinai
Cebrennus concolor (Denis, 1947) --- Siwa Oasis *
Cerbalus pellitus Kritscher, 1960 --- Fayed (near Suez) *
Cerbalus pulcherrimus (Simon, 1880) --- Assuan, Wadi Natron
Eusparassus bicorniger (Pocock, 1898) --- ?
Eusparassus dufouri Simon, 1932 --- ?
Eusparassus oraniensis (Lucas, 1846) --- Siwa Oasis
Eusparassus walckenaeri (Audouin, 1825) --- Cairo, El-Shalateen and Bir El-Gahliya (S.E.Egypt), Siwa Oasis, southern Sinai, Upper Egypt, Wadi Natron
Gnathopalystes crucifer (Simon, 1880) --- ?
Heteropoda variegata (Simon, 1874) --- ?
Olios suavis (O.P.-Cambridge, 1876) --- Siwa Oasis, Upper Egypt

Family Tetragnathidae
Dyschiriognatha argyrostilba (O.P.-Cambridge, 1876) --- Alexandria *
Tetragnatha filiformis (Savigny, 1825) --- Alexandria, Nile Delta (Lower Egypt) *
Tetragnatha flava (Savigny, 1825) --- Alexandria, Rosetta *
Tetragnatha isidis (Simon, 1880) --- Alexandria
Tetragnatha nitens (Savigny, 1825) --- Alexandria, Cairo, Manzalah (lake), Rosetta, Siwa Oasis, Wadi El-Rayian, Wadi Natron

Family Theridiidae
Anelosimus aulicus (C.L.Koch, 1838) --- Alexandria, Nile Delta, Siwa Oasis, Wadi Natron
Argyrodes argyrodes (Walckenaer, 1841) --- Siwa Oasis
Crustulina conspicua (O.P.-Cambridge, 1872) --- Giza
Enoplognatha deserta Levy & Amitai, 1981 --- St.Catherine
Enoplognatha gemina Bosmans & Van Keer, 1999 --- Alexandria, Cairo
Euryopis acuminata (Lucas, 1846) --- Alexandria, Giza, Ismailia
Euryopis albomaculata Denis, 1951 --- ? *
Euryopis campestrata Simon, 1907 --- Cairo *
Euryopis quinqueguttata Thorell, 1875 --- Siwa Oasis
Latrodectus geometricus C.L.Koch, 1841 --- ?
Latrodectus pallidus O.P.-Cambridge, 1872 --- Alexandria, Nabq Prot. (S.Sinai)
Latrodectus tredecimguttatus (Rossi, 1790) --- Alexandria, El-Tahrir Province, Salahyeh, Sinai (Mid & S.)
Nesticodes rufipes (Lucas, 1846) --- Cairo
Paidiscura dromedaria (Simon, 1880) --- Ismailia
Steatoda ephippiata (Thorell, 1875) --- Mid Sinai
Steatoda erigoniformis (O.P.-Cambridge, 1872) --- Alexandria, Nile Delta
Steatoda latifasciata (Simon, 1873) --- Mid Sinai, St.Catherine
Steatoda paykulliana (Walckenaer, 1805) --- Alexandria, southern Sinai
Steatoda triangulosa (Walckenaer, 1802) --- Cairo, Wadi Natron
Steatoda venator (Savigny, 1825) --- Alexandria *
Theridion melanostictum O.P.-Cambridge, 1876 --- Alexandria, Nile Delta
Theridion musivum Simon, 1873 --- Mid Sinai
Theridion nigrovariegatum Simon, 1873 --- Alexandria, Ismailia, Siwa Oasis, Suez
Theridion spinitarse O.P.-Cambridge, 1876 --- Cairo, Luxor
Theridion varians Hahn, 1831--- Alexandria

Family Thomisidae
Firmicus dewitzi Simon, 1899 --- Wadi Natron
Heriaeus buffoni (Audouin, 1825) --- Ras Mohammed Prot. (S.Sinai)
Misumena atrocincta Costa, 1875 --- ? *
Ozyptila judaea Levy, 1975 --- Sinai (near Taba)
Ozyptila subclavata (O.P.-Cambridge, 1876) --- Alexandria
Pistius truncatus (Pallas, 1772) --- ?
Runcinia lateralis (C.L.Koch, 1838) --- Alexandria, El-Arish, El-Bawitti (El-Baharia Oases), Fatira (Kom Ombo), Kom Osheem
Synema candicans (O.P.-Cambridge, 1876) --- Alexandria *
Synema diana (Audouin, 1825) --- Cairo to Luxor, Fatira (Kom Ombo), Kom Osheem, Nabq Prot. (S.Sinai), Ras El-Barr, Siwa Oasis, Wadi Esla, Wadi Natron
Synema globosum (Fabricius, 1775) --- ?
Synema valentinieri Dahl, 1907 --- Upper Egypt *
Thomisus bidentatus Kulczyński, 1901 --- southern Sinai
Thomisus hilarulus Simon, 1875 --- Siwa Oasis
Thomisus onustus Walckenaer, 1805 --- El-Zaranik Prot. (west of El-Arish), Kom Osheem, Ras El-Barr, Siwa Oasis, southern Sinai, Wadi El-Raiyan
Thomisus spinifer O.P.-Cambridge, 1872 --- Assuan, Cairo to Luxor, El-Arish (N.Sinai), El-Bawitti (El-Baharia Oases), Fatira (Kom Ombo), Nile Delta, Siwa Oasis, Wadi Natron
Tmarus piochardi (Simon, 1866) --- Siwa Oasis
Xysticus bliteus (Simon, 1875) --- Alexandria, Cairo
Xysticus clercki (Audouin, 1825) --- ?
Xysticus cristatus (Clerck, 1757) --- Alexandria
Xysticus ferus O.P.-Cambridge, 1876 --- Alexandria, southern Sinai
Xysticus lalandei (Audouin, 1825) --- Cairo, southwestern Sinai *
Xysticus peccans O.P.-Cambridge, 1876 --- ? *
Xysticus sabulosus (Hahn, 1831) --- ?
Xysticus tristrami (O.P.-Cambridge, 1872) --- Cairo (Giza), Rafah, St. Catherine

Family Titanoecidae
Nurscia albomaculata (Lucas, 1846) --- Alexandria
Titanoeca tristis L.Koch, 1872 --- ?

Family Uloboridae
Uloborus plumipes Lucas, 1846 --- Cairo to Assiut, Nile Valley and near Red Sea, Siwa Oasis
Uloborus walckenaerius Latreille, 1806 --- Siwa Oasis

Family Zodariidae
Lachesana perversa (Savigny, 1825) --- Cairo
Palaestina eremica Levy, 1992 --- St.Catherine
Ranops expers (O.P.-O.P.-Cambridge, 1876) --- Alexandria, St.Catherine
Trygetus riyadhensis Ono & Jocqué, 1986 --- St.Catherine
Trygetus sexoculatus (O.P.-Cambridge, 1872) --- Suez, W.S.Sinai
Zodarion nitidum (Savigny, 1825) --- Alexandria, Cairo, northern Sinai
Zodarion occitaneum (Duges, 1836) --- Alexandria *
Zodarion pileolonotatum Denis, 1935 --- Siwa Oasis

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A seven-legged araneid spider from Egypt (Araneida: Araneidae)

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Larinioides suspicax (O.P.-Cambridge, 1876) (Family Araneidae) is widely distributed from the Mediterranean countries to Central Asia (Platnick, 2002). In Egypt, it was recorded from: Alexandria, Damietta, El-Fayum, Rosetta, Siwa Oases, and Wadi Natron by different authors (El-Hennawy, 1990, 2002). The webs of this species were found among herbs and low plants especially in regions near water supplies and in marshes.

In 18 August 1980, in the region of El-Mazraa (31º29'58"N 31º48'30"E), about 400 m from the seashore, in Ras El-Barr (on the Mediterranean coast), a female spider of *L. suspicax* was found in her orbweb among herbs. She was with her newly hatched spiderlings. In captivity, she laid eggs, on 22 August, to get more spiderlings. The unusual and unexpected thing was that the mother had only three legs at the left side (Fig. 1). Leg III was not found in its normal position. It was not broken. There were only three coxae instead of four (Fig. 2). The spider had normal web and was sexually normal (to put eggs in nature and in captivity). All the spiderlings were normal eight-legged spiders to prove that this case of mutation was not inherited.

The following measurements (in millimetres) were provided to compare the left side legs with the right side legs. It was not possible to get more measurements without destructing hardened legs.

TL 11.985, Cephalothorax L 5.185 W 4.675, Abdomen L 6.8 mm

Femur length:

Leg	I	II	III	IV
Right	4.845	4.250	2.975	3.995
Left	4.845	4.250	-----	3.825

Leg IV	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Right	3.995	1.870	2.805	2.975	1.063	12.708
Left	3.825	2.125	2.805	2.975	1.063	12.793

This rare kind of anomaly reminds with the colour anomaly recorded by Yaginuma (1971). It is a wonderful case.

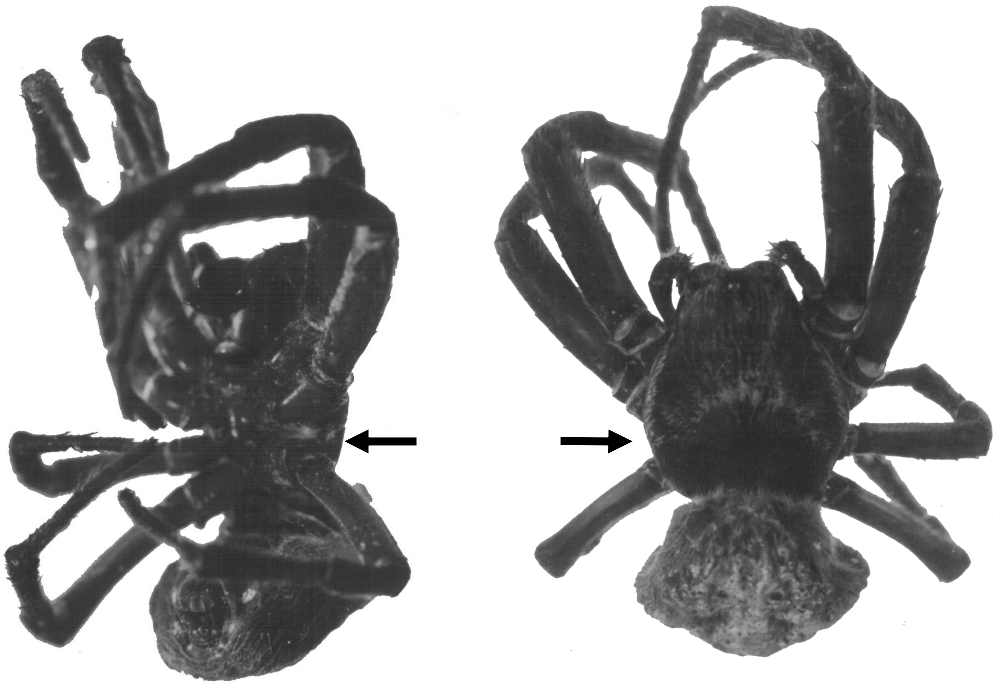

Figure 1. Seven-legged *Larinioides suspicax* female, dorsal view (right) and ventral view (left).

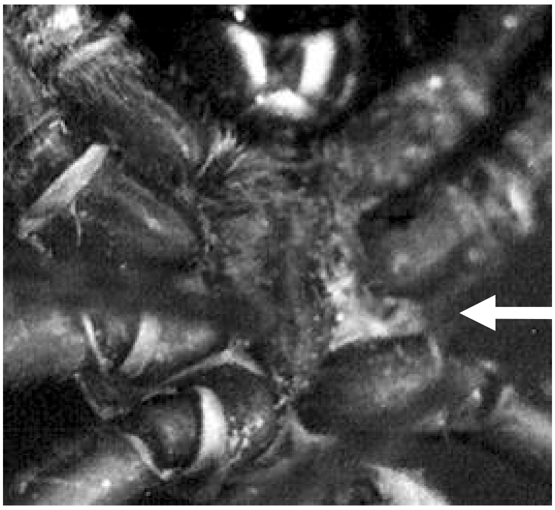

Figure 2. The seven-legged *Larinioides suspicax*. Coxae of legs (detail).
[The arrows point to the position of the unfound leg.]

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